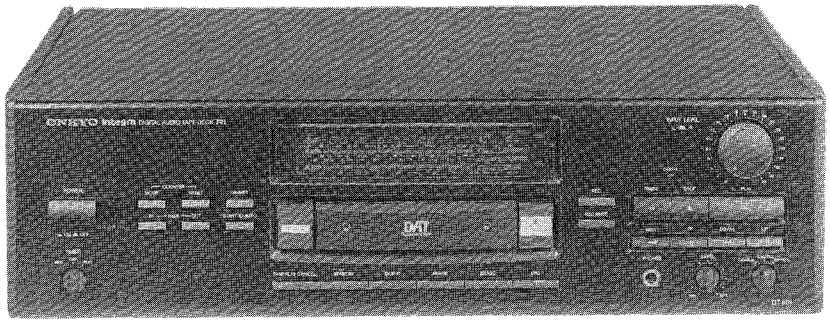
REF. NO. 3412

ONKYO® SERVICE MANUAL

DIGITAL AUDIO TAPE DECK
MODEL DT-901



Black model

BHUDN, BHUD	120V AC, 60Hz
BHUP	230V AC, 50Hz
BHUW	120V/ 220V AC, 50/60Hz
BHUQA	240V AC, 50Hz

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK ⚠ ON THE SCHEMATIC DIAGRAM AND IN THE PARTS LIST ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE THESE COMPONENTS WITH ONKYO PARTS WHOSE PARTS NUMBERS APPEAR AS SHOWN IN THIS MANUAL.

MAKE LEAKAGE-CURRENT OR RESISTANCE MEASUREMENTS TO DETERMINE THAT EXPOSED PARTS ARE ACCEPTABLY INSULATED FROM THE SUPPLY CIRCUIT BEFORE RETURNING THE APPLIANCE TO THE CUSTOMER.

ONKYO
AUDIO COMPONENTS

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SPECIFICATIONS

Signal Format

Tape Recording System:	Rotating head system DAT
Sampling Frequencies:	Recording: 48kHz, 44.1kHz, 32kHz (automatic digital input switching) Playback: 48kHz, 44.1kHz, 32kHz (automatic switching)
Number of Quantization Bits:	16-bit linear
Number of channels:	2-channel (stereo)

Audio (Analog recording and playback)

Frequency Response:	2Hz — 22.000Hz
Dynamic Range:	90dB or more
S/N Ratio:	90dB or more
Total Harmonic Distortion:	0.005% or lower
Wow & Flutter:	Unmeasurable

Input/Output jacks

Analog Input jacks	
Lowest Input Level:	450mV
Input Impedance:	20k ohms
Analog Output jacks	
Full-Scale Output Level:	2V
Output Impedance:	600 ohms
Headphone Output:	Max. 45mW + 45mW/32 ohms (most suitable impedance is 8 to 600 ohms)
Digital Input Jacks:	Coaxial/75 ohms, Optical (switch equipped)
Digital Output:	Optical

Mechanism

Head:	Amorphous/ferrite composite
Cylinder Diameter:	30mm, 1-3/16"
Cylinder Rotational Speed:	2000 r.p.m. (during recording and playback)
Tape Speed:	8.15mm (5/16") /sec., 12.225mm (1/2") /sec. (automatic switching)
Search Speed:	Max. 400 times normal
High-Speed Rewind Time:	About 27 seconds (120 minute tape)

General

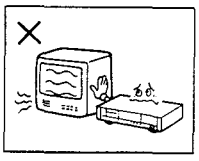
Power Consumption:	25W
External Dimensions:	455 (W) × 130 (H) × 371 (D) mm
Weight:	17-15/16" (W) × 5-1/8" (H) × 14-11/16" (D) 7.2Kg, 15.9 lbs.

Specifications and external appearance are subject to change without notice because of product improvements.

INSTALLATION

Avoid locations nearby tuners or television sets.

Since this unit uses high-frequency signals, placing it near a tuner or television set may result in interference with the tuner/TV reception. If this kind of audio or video interference is experienced, move the DAT unit away from other AV components.

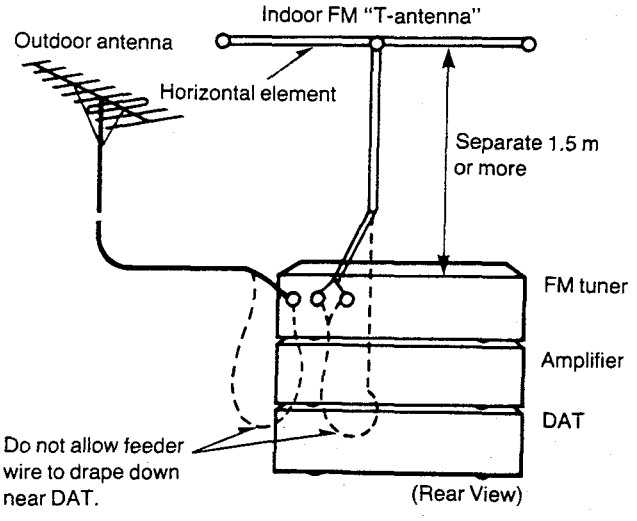


The some kind of phenomenon may occur when using an indoor TV antenna; whenever possible, use an outdoor antenna instead.

Precautions when using an indoor wire-strip antenna (T-antenna) with FM tuner.

Separate the horizontal elements of the FM antenna at least 1.5 cm from the tuner.

Do not allow the feeder wire from an indoor or outdoor FM antenna to drape near the DAT unit. If excess feeder wire is present inside the room, coil it up as far as possible away from the DAT unit.

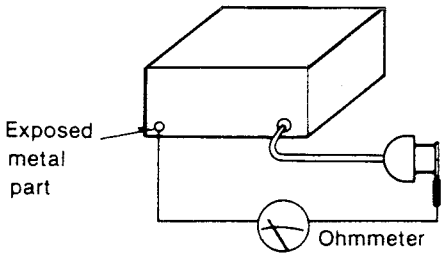


SAFETY PRECAUTION (This "safety precautions" is applied only in U.S.A.)

1. Before servicing, unplug the power cord to prevent an electric shock.
2. When replacing parts, use only manufacturer's recommended components for safety.
3. Check the condition of the power cord. Replace if wear or damage is evident.
4. After servicing, be sure to restore the lead dress, insulation barriers, insulation papers, shields, etc.
5. Before returning the serviced equipment to the customer, be sure to make the following insulation resistance test to prevent the customer from being exposed to a shock hazard.

• INSULATION RESISTANCE TEST

1. Unplug the power cord and short the two prongs of the plug with a jumper wire.
2. Turn on the power switch.
3. Measure the resistance value with ohmmeter between the jumpered AC plug and each exposed metal cabinet part, such as control shafts, handle brackets, etc. Equipment without antenna terminals should read approximately infinity to all exposed parts.



Resistance = Approx ∞

4. If the measurement is outside the specified limits, there is a possibility of a shock hazard. The equipment should be repaired and rechecked before it is returned to the customer.

SERVICE GUIDE

1. Voltage Selector (Rear Panel)

Worldwide models are equipped with a voltage selector to conform with local power supplies. Be sure to set this switch to match the power supply in your area before turning the power switch on. Voltage is changed by sliding the groove in the switch with a screwdriver to the right or left. Confirm that the switch has been moved all the way to the right or left before turning the power switch on. Models without a voltage selector can only be used in areas where the power supply voltage is the same as that of the unit.

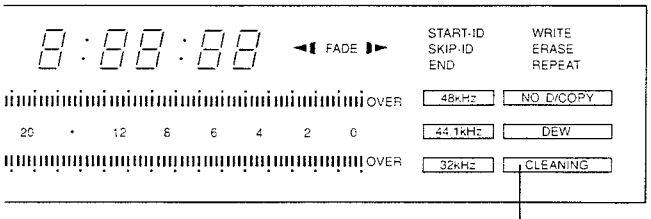
2. Dew (moisture condensation)

If the deck is moved from a cold environment to a warm one, condensation may form on the rotary head. In these circumstances, tape may adhere to the head, causing possible damage to the tape and/or the head. To prevent this happening, the unit is provided with a moisture sensor. If condensation has formed on the head, the sensor will detect this, and the [DEW] symbol will flash on the display.

If this [DEW] symbol is flashing on the display, eject the tape and remove it. Leave the power on for about one hour, until the [DEW] symbol is no longer shown on the display.

3. Cleaning the rotary heads

Dust or dirt on the rotary heads (the parts that touch the tape) can cause lower quality recording or playback. This unit is equipped with a cleaning indicator that flashes when dirt is detected on the heads. A dirty or damaged cassette might also cause this indicator to flash. When the indicator flashes, play another cassette. If the indicator does not go out after a minute or two, clean the heads with a special DAT cleaning tape (optional).



CLEANING indicator

- After using the cleaning tape, if playback quality has improved but becomes worse after a few playings, it could be that the cassette tape is old. In this case, use a new cassette tape.
- If sound quality doesn't improve even after using the cleaning tape, consult with your dealer.
- The cleaning tape cannot be used for recording or playback. (Please read the instructions that come with the cleaning tape.)

Cleaning this unit

(For safety, unplug the power plug.)

Clean the cabinet with a soft cloth. If it is very dirty, use a soft cloth slightly moistened with a weak soap solution, and wipe with a dry soft cloth.

TERMINAL FUNCTION OF IC'S

• IC101 (AN7030SE2): RF AMP.

Pin No.	Mark	I/O Division	Function
1	V_{CC} 1	I	Power supply terminal
2	ACH FB	O	Playback feed back signal (Ach)
3	ACH IN	I	Playback amp. signal (Ach)
4	GND 1	—	GND terminal
5	BCH IN	I	Playback amp. signal (Bch)
6	BCH FB	O	Playback feed back signal (Bch)
7	AREC PCM	I	RF recording level adj. terminal
8	AREC PLT		
9	AREC ATF		
10	BREC ATF		
11	BREC PLT		
12	BREC PCM		
13	REC CNT 1	I	Track pitch signal
14	REC CNT 2	I	ATF area det. signal
15	SRRF IN	I	Recording signal
16	GND 2	—	GND terminal
17	VREF	O	Reference voltage terminal (Not used, open)
18	AREC OUT	O	Recording signal (Ach)
19	BREC OUT	O	Recording signal (Bch)
20	BTL REC	O	Recording control signal
21	V_{CC} 2	I	Power supply terminal
22	REC ON	O	Recording drive terminal (REC: "H")
	PLAY ON	O	Playback drive terminal (PLAY: "H")

Pin No.	Mark	I/O Division	Function
24	HSW	I	Head switching signal
25	AR/RSEL	I	Not used, connected to power supply
26	R/PSEL	I	Recording/playback select signal (REC: "H", PLAY: "L")
27	EQ OUT	O	Equalization signal
28	EQ IN 3	I	Equalization amp. signal
29	EQ IN 2		
30	EQ IN 1		
31	BF REQ	I	Equalization amplitude drive terminal (Bch)
32	B PHASE	I	Equalization phase drive terminal (Bch)
33	B GAIN	I	Equalization gain drive terminal (Bch)
34	AF REQ	I	Equalization amplitude drive terminal (Ach)
35	A PHASE	I	Equalization phase drive terminal (Ach)
36	A GAIN	I	Equalization gain drive terminal (Ach)
37	SV RF	O	Playback signal
38	GND 3	—	GND terminal
39	A INT	I	Playback amp. signal (Ach)
40	B INT	I	Playback amp. signal (Bch)
41	B INT IN	O	Playback amp. signal (Bch)
42	A INT IN	O	Playback amp. signal (Ach)

• IC201 (MN6742SDR): Servo processor

Pin No.	Mark	I/O Division	Function
1	OP10A	O	Cylinder rotative stop signal
2	SCK	I	Serial clock signal
3	SDA	I/O	Serial data signal
4	OSC 1	I	System clock (8MHz) signal
5	OSC 2	O	
6	NRST	I	Reset signal
7	NC	—	Not connection
8	OP20A	O	SSP ready signal
9	NC	—	Not connection
10	V_{SS}	—	GND terminal
11	VHS	—	Not used, open
12	OP 101	O	CAPFG/RLFGT select signal
13	TP 2	O	R3CP/RLFGT select signal
14	TP 3	I	PLL off-set/parallel data signal
15	TP 4		
16	TP 5		
17	TP 6		
18	TP 7	I	PLL off-set/data effective flag terminal
19	TP 8	I	Not used, connected to power supply
20	MOS	I	Serial port/strobe signal
21	TST	I	Test mode terminal (Normal, connected to GND)
22	ENC	—	Connected to GND terminal
23	NC	—	Not connection
24	NC		
25	V_{DD}	I	Power supply terminal
26	NC	—	Not connection
27	RSW	—	Not used, open
28	HAS	O	A/D input select signal
29	AVM	—	Not used, connected to GND
30	VLP	—	Not used, open
31	STM	I	R3TU or RLFGT (64 P/R) signal
32	STR	I	Comparator reference signal of STM input

Pin No.	Mark	I/O Division	Function
33	CAE	O	Capstan velocity control signal
34	CYE	O	Cylinder velocity control signal
35	END	I	VREF or ATFTER voltage signal
36	VSY	I	$\overline{\text{CYLPG}}$ signal
37	ASH 1	I	Capstan FG or RLFGT signal after EXOR
38	NC	—	Not connection
39	AFB 1	O	Inverter amp. signal of ATFTER input (Not used, open)
40	NC	—	Not connection
41	AFG 1	I	ATF tracking error voltage terminal
42	ASH 2	O	Not used, connected to GND
43	AFB 2	O	Not used, open
44	NC	—	Not connection
45	AFG 2	I	Reference voltage terminal
46	VDA	I	Power supply terminal
47	VSA	—	GND terminal
48	ORE	O	Reference voltage terminal
49	IRE	I	
50	GND	—	GND terminal
51	IPL	O	Not used, open
52	NC	—	Not connection
53	CLP	I	Not used, connected to GND
54	CP 1	O	Not used, open
55	CP 2	I	Supply reel FG signal
56	NC	—	Not connection
57	NC		
58	CN 1	O	Not used, open
59	CN 2	I	Not used, connected to GND
60	CTL	O	Not used, open
61	PFG	I	Cylinder FG signal
62	PGM	I	Not used, connected to GND
63	CUL	O	Capstan rotative direction signal
64	NC	—	Not connection

• IC102 (AN7035SCE2): Playback PLL

Pin No.	Mark	I/O Division	Function
1	LPF	O	Buffer amp. 1 reference terminal
2	GND 1	—	GND terminal
3	ENVC	O	ENV time constant setting terminal
4	ENVR	I	ENV threshold voltage adj. terminal
5	RSENV	O	RF envelope signal
6	RSENVC	O	RSENV time constant setting terminal
7	RSRF	I	RF signal
8	DELOUT	O	RF signal
9	DELIN 1	I	Delay (45°) signal
10	DELIN 2	I	Delay (90°) signal
11	PDOUT	O	Phase comparator signal
12	VREF 1	I	V/I converter reference voltage terminal
13	VCOV	I	OSC frequency control terminal
14	R/P	I	Recording/playback select terminal (Not used, connected to GND)
15	VCOR	I	OSC frequency adj. terminal

Pin No.	Mark	I/O Division	Function
16	V_{CC} 1	I	Power supply terminal
17	VCOC 1	O	VCO terminal
18	VCOC 2	O	VCO terminal
19	V_{CC} 2	I	Power supply terminal
20	PLL CP 1	O	Clock (2CK) signal (Not used, open)
21	PLL CP 2	O	Clock (CK) signal
22	DEMCOD	O	NRZI demodulated signal for playback signal with PLL
23	SVSYNC	O	ATF sync. signal
24	GND 2	—	GND terminal
25	OP OUT 3	O	ATF 3 signal
26	OP IN 3	I	ATF 3 signal
27	OP OUT 2	O	ATF 2 signal
28	OP IN 2	I	ATF 2 signal
29	OP OUT 1	O	ATF 1 signal
30	OP IN 1	I	ATF 1 signal
31	VREF 2	I	Reference voltage terminal
32	COMP 1	I	Output amp. 1 (+) signal

• Q503(CS5339KP): A/D Converter

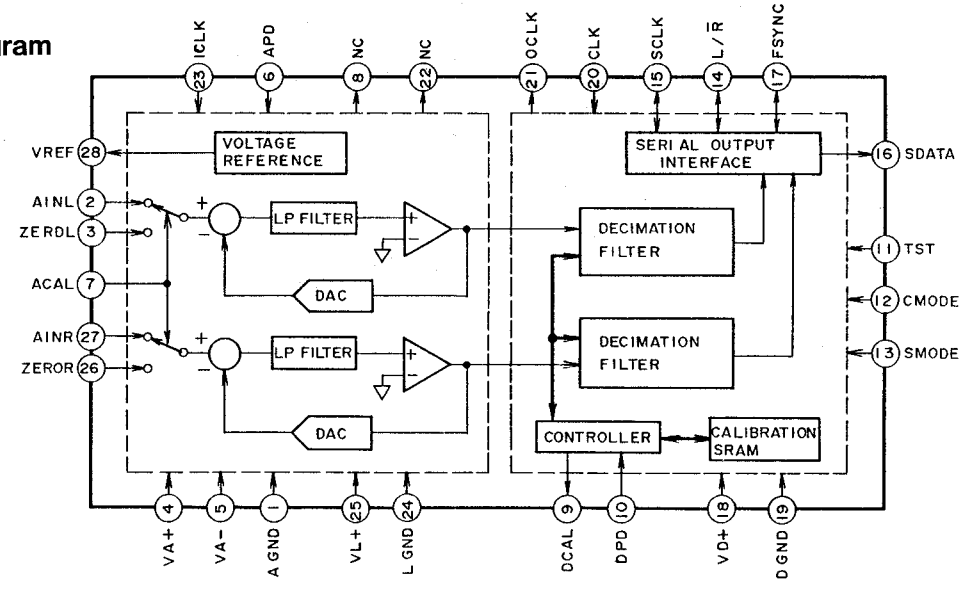
Pin No.	Mark	I/O	Function	Pin No.	Mark	I/O	Function
1	AGND		Analogue ground.	14	L/R	I/O	Input channel select.
2	AINL	I	Analogue input for the left channel.	15	SCLK	I/O	Serial data clock pin.
3	ZEROL	I	Zero level input for the left channel.	16	SDATA	O	Serial data output pin.
4	VA+		Analogue positive power supply(+5V)	17	FSYNC	I/O	Frame synchronization clock pin.
5	VA-		Analogue negative power supply(-5V)	18	VD+		Power supply for the digital section.(+5V)
6	APD	I	Power down pin for the analogue section. Power down mode when is low level.	19	DGND		Groun pin for the digital section.
				20	CLK	I	Master clock input pin.
7	ACAL	I	Analogue calibration pin.Connect to DCAL. H:Zero level input L:Analogue input	21	OCLK	O	128fs clock output pin.
				22	NC		
8	NC			23	ICLK	I	128fs clock input pin.
9	DCAL	O	Digital calibration pin.	24	LGND		Logic ground pin for the analogue section.
10	DPD	I	Power down pin for the digital section.	25	VL+		Logic power supply for the analogie section.(+5V)
11	TST	I	Test pin.	26	ZEROR	I	Zero level input pin for a right channel.
12	CMODE	I	Master clock select.L:CLK=256fs H:CLK=384fs	27	AINR	I	Analogue input pin for a right channel.
13	SMODE	I	Interface clock select.	28	VREF	O	Reference voltage output pin.(-3.68V)

• IC202 (MN53020SDQ): ATF

Pin No.	Mark	I/O Division	Function
1	NSNCOK	O	SYNC det. monitor terminal
2	SVAL	I	ATF select terminal
3	PCMOK	I	PCM playback monitor terminal
4	SPE	O	Starting pulse of counter track lock
5	SP 2	O	Sampling pulse signal for pilot signal of adjacent track
6	SP 1		
7	DCYLPG	I	Cylinder PG signal
8	DCAPFG 1	I	Capstan FG signal
9	DCAPFG 2		
10	DRLFGT	I	Take-up reel FG signal
11	DCYLFG	I	Cylinder FG signal
12	SYNC	I	ATF sync. det. terminal
13	NRST	I	Reset signal
14	R3CP	I	Timing signal for RF envelope signal control
15	ENVT		
16	FCH	I	System clock signal (9.408 MHz)
17	V_{DD}	I	Power supply terminal
18	V_{SS}	—	GND terminal
19	MODE 1	I	SYNC det. select terminal (Not used, connected to GND)
20	HFCH	I	Clock signal for PLL off-set data
21	PLLOFS	I	PLL off-set data signal

Pin No.	Mark	I/O Division	Function
22	TEST 6	—	Not used, connected to GND
23	P MODE	I	Pulse width select terminal
24 ∫ 28	TEST 1 ∫ TEST 5	I	Test terminal (Not used, connected to GND)
29	SPHT	—	Not used, open
30	HSWS	O	Head switching signal (33.33 Hz)
31	HSWR		
32	SEL A	I	CAPFGTU signal select terminal
33	SEL B	I	R3TU signal select terminal
34	PLL 0	O	Output signal after decoded 4 bit parallel data of PLLOFS
35	PLL 1		
36	PLL 2		
37	PLL 3		
38	MODE 2	—	Not used, open
39	V_{SS} 2	—	GND terminal
40	V_{DD} 2	I	Power supply terminal
41	R3TU	O	Building-up edge signal of R3CP/DRLFGT
42	CAPFGTU	O	Capstan FG signal/Take-up reel FG signal
43	CAPER	O	Capstan rotative direction control signal
44	NLNROK	O	Track linearity monitor terminal

CS5339KP Block diagram



• IC203 (AN8320NFA): Linear servo

Pin No.	Mark	I/O Division	Function
1	FG1 AO	O	Capstan FG signal
2	FG1 AI	I	Capstan FG (−) signal
3	FG1 FI	—	Frequency characteristic setting terminal
4	CYL PG	O	Cylinder PG signal
5	PGVR	—	PG delay time adj. terminal
6	CYPGI	I	PG schmidt comparator terminal
7	GND	—	GND terminal
8	SVRF	I	ATF terminal
9	CPD	—	Det. capacity connection terminal
10	CCI	O	Full-wave rectification buffer terminal
11	CCO	I	Clamp circuit terminal
12	SP 1	I	SP 1 terminal
13	SP 2	I	SP 2 terminal
14	VSPE	—	SPE setting terminal
15	SPE	I	SPE terminal
16	CSH	I	Hold capacity connection terminal
17	ATFTER	O	ATF control command signal
18	CFB	—	Phase compensation terminal
19	V_{CC}	I	Power supply terminal
20	ATFON	I	ATF ON terminal (Not used, connected to power supply)
21	PTBIA	—	Photo-transistor bias terminal (Not used, open)
22	VREF	O	Reference voltage terminal
23	LEDR 1	I	Bias voltage terminal
24	LEDH 1	—	Constant current terminal (Not used, open)
25	LEDR 2	I	Bias voltage terminal

Pin No.	Mark	I/O Division	Function
26	LEDH 2	—	Constant current terminal (Not used, open)
27	CYL FG	O	Cylinder FG signal
28	CYF GSI	I	Cylinder schmidt comparator terminal
29	CYF GAO	O	Cylinder op. amp. terminal
30	CYF GAI	I	Cylinder op. amp. (−) terminal
31	NST BY	I	STAND BY signal (Not used, connected to power supply)
32	TF GAI	I	Take-up reel op. amp. (−) terminal
33	TF GAO	I	Take-up reel op. amp. terminal
34	TF GSI	I	Take-up reel schmidt comparator terminal
35	RLFGT	O	Take-up reel FG signal
36	RLFGS	O	Supply reel FG signal
37	SF GSI	I	Supply reel schmidt comparator terminal
38	SF GAO	O	Supply reel op. amp. terminal
39	SF GAI	I	Supply reel op. amp. terminal
40	V_{CC}	I	Power supply terminal
41	FG 2FI	—	Frequency characteristic setting terminal
42	FG 2AI	I	Capstan FG (−) signal
43	FG 2AO	O	Capstan FG signal
44	FG 2SI	I	Captan FG schmidt comparator terminal
45	CPFG 2	O	Capstan FG signal
46	FILSLD	I	Frequency characteristic $\overline{\text{DOWN}}$ terminal
47	CPFG 1	O	Capstan FG signal
48	FG 1SI	I	Capstan FG schmidt comparator terminal

• IC271 (MN17541SDN2): Mechanism control

Pin No.	Mark	I/O Division	Function
1	NSBOA	O	Serial data signal
2	NRST	I	Reset signal
3	NSYNC	—	Not used, open
4	X 2		
5	X 1		
6	V_{SS}	—	GND terminal
7	OSC 2	—	Not used, open
8	OSC 1	I	Clock signal
9	V_{DD}	I	Power supply terminal
10	NTC1B	I	Supply reel FG signal
11	NIRQ 0	I	Take-up reel FG signal
12	NIRQ 1	I	Transfer strobe signal of system control
13	P00 (MSTB)		
14	P 01 (MRDY)	O	Transfer ready signal of system control
15	P 02 (NSSTB)	O	Transfer strobe signal
16	P 03 (NSRDY)	I	Transfer ready signal
17	P 10 (ATFGT)	O	ATF gain (× 1/2) select terminal
18	P 11 (REWGT)	O	REW FG • PG gain select terminal
19	P 12 (LPMOD)	—	Not used, open
20	P 13 (MODMT0)	O	Mode motor control signal
21	P 20 (MODMT1)		
22	P 21 (MODMT2)		
23	P 22	—	Not used, open
24	P23 (PLG)	O	Plunger control signal
25	P 30	—	Not used, open
26	P 31		
27	P 32 (LOAD 1)	O	Tray motor control (+) terminal
28	P 33 (LOAD 2)	O	Tray motor control (−) terminal
29	P 40	—	Not used, open
30	P 41 (DEW)	I	Dew sensor det. signal
31	P 42 (EOT)	I	Tape end det. signal
32	P 43 (BOT)	I	Tape begin det. signal
33	P 50 (OPEN)	I	Cassette open det. signal

Pin No.	Mark	I/O Division	Function
34	P 51 (CLOSE)	I	Cassette close det. signal
35	P 52 (LOAD S)	I	Loading start det. signal
36	P 53 (LOAD E)	I	Loading stop det. signal
37	P 60 (SW 2)	O	Test terminal
38 ∫ 40	P 61 (MMOD 0) ∫ P 63 (MMOD 2)	I	Tape mode det. signal
41 ∫ 44	P 70 (MBUS 0) ∫ P 73 (MBUS 3)	I/O	Transfer bus terminal of system control
45	P 80 (RCC)	—	Not used, open
46	P 81 (FIL)	O	FILTER select signal
47	P 82 (ATFON)	—	Not used, open
48	P 83 (NSTBY)	—	Not used, open
49	P 90 (NSRST)	O	Reset signal
50	P 91 (LEDDRV)	O	Tape begin/end LED control signal
51	P 92 (PCMOK)	I	PCM playback det. signal
52	P 93 (SVAL 0)	I	ATF effective position setting terminal
53	NEXPS	I	Not used, connected to power supply
54	PA 0 (NSNCOK)	I	ATF sync. det. terminal
55	PA 1 (NLNOK)	I	Track linearity det. terminal
56	PA 2 (CAPER)	I	Capstan rotative direction command signal
57	PA 3	—	Not used, open
58	PB 0 (TH 1)	I	Tape hall det. signal
59	PB 1 (TH 2)		
60	NSBTB	I	Muting det. signal
61	NSBIB	I	Test terminal
62	NSBOB		
63	NSBTA (SCLK)	I	Serial transfer clock signal
64	NSBIA (SDAT)	I/O	Serial transfer data signal

• Q303 (MN6624): Digital signal processor

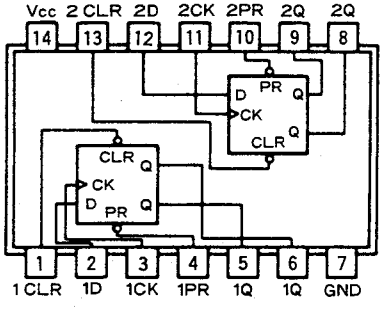
Pin No.	Mark	I/O Division	Function
1	PCMCIF	O	Flag counter terminal
2	IDPP		
3	IDP	O	Test terminal
4	V_{DD}	I	Power supply terminal
5	TESTS	—	Not used, connected to GND
6	V_{SS}	—	GND terminal
7	CKIO FS	—	Not used, open
8	CKIO 128	O	Test terminal
9	CKIO 512	—	Not used, open
10	NDALOAD	—	Not used, open
11	DADAT	O	DA data signal
12	DALRCK	O	LR discrimination signal
13	DABCK	O	Serial bit clock signal
14	DAMCK	—	Not used, open
15	V_{DD}	I	Power supply terminal
16	TEST 6	—	Not used, open
17	V_{SS}	—	GND terminal
18	ADDAT	I	AD data signal
19	ADLRCK	O	LR discrimination signal
20	ADBCK	O	Serial bit clock signal
21	ADMCK	O	External clock signal
22	TX	O	Digital signal
23	RX	I	
24	VCOS L32	—	Not used, open
25	VCOS L44		
26	VCOS L48		
27	DIO REF	O	Digital signal (PLL control)
28	DIO VAR	O	
29	V_{DD}	I	Power supply terminal
30	DI 512	I	Digital signal (512FS)
31	V_{SS}	—	GND terminal
32	XO 4	—	Not used, open
33	XI 4	I	Crystal terminal (32kHz×512)
34	TEST 0	—	Not used, connected to GND
35	XO 3	—	Not used, open
36	XI 3	I	Crystal terminal (44.1kHz×512)
37	TEST 1	—	Not used, connected to GND
38	XO 2	—	Not used, open
39	XI 2	I	Crystal terminal (48kHz×512)

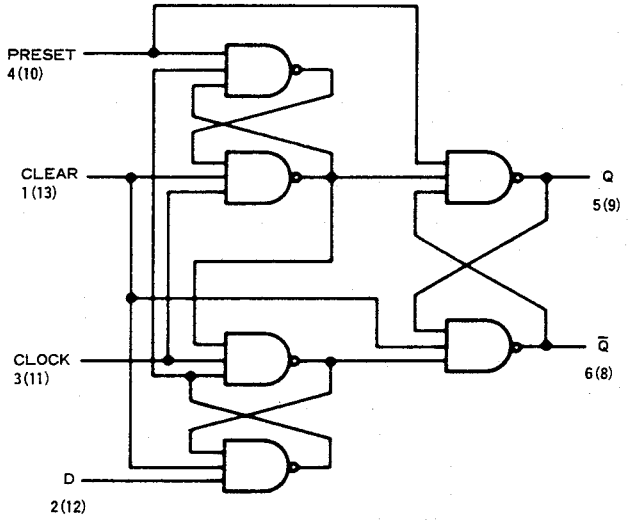
Pin No.	Mark	I/O Division	Function
40	V_{DD}	I	Power supply terminal
41	XO 1	O	Crystal OSC terminal
42	XI 1	I	
43	V_{SS}	—	GND terminal
44	PC OUT	—	Not used, open
45	RAD 0	O	RAM address bus termainal
46	RAD 1		
47	RAD 2		
48	RAD 3		
49	RAD 4		
50	RAD 5		
51	RAD 6		
52	RAD 7		
53	V_{DD}	I	Power supply terminal
54	TEST 2	—	Not used, connected to GND
55	V_{SS}	—	GND terminal
56	RAD C	O	RAM address bus terminal
57	RAD E		
58	NWE	O	Write enable for memory
59	RAD D	O	RAM address bus terminal
60	RAD 8		
61	RAD 9		
62	RAD B		
63	NOE	O	Output enable for memory
64	RAD A	O	RAM address bus terminal
65	V_{DD}	I	Power supply terminal
66	NCS	O	Chip select terminal for memory
67	V_{SS}	—	GND terminal
68	RDT 7	I/O	RAM data bus terminal
69	RDT 6		
70	RDT 5		
71	RDT 4		
72	RDT 3		
73	RDT 2		
74	RDT 1		
75	RDT 0		
76	V_{SS}	—	GND terminal
77	TEST 3	—	Not used, connected to GND
78	V_{DD}	I	Power supply terminal

Pin No.	Mark	I/O Division	Function
79	SPDT 7	I/O	Address and data bus terminal
80	SPDT 6		
81	SPDT 5		
82	SPDT 4		
83	SPDT 3		
84	SPDT 2		
85	SPDT 1		
86	SPDT 0		
87	V_{SS}	—	GND terminal
88	TEST 4	—	Not used, connected to GND
89	V_{DD}	I	Power supply terminal
90	SPAW	I	Signal processor address setting terminal
91	SPSTB	I	Signal processor strobe signal
92	SPRDY	O	Data transfer command signal
93	UNLOK	O	PLL unlock signal
94	DISYND	—	Not used, open
95	NSTBY	I	Not used, connected to power supply
96	NRST	I	Reset signal
97	M7CK	—	Master clock signal (Not used, open)
98	R6CP/ (ENVT)	O	Timing signal for RF envelope signal control
99	R3CP		
100	V_{SS}	—	GND terminal
101	SRRF	O	Recording signal

Pin No.	Mark	I/O Division	Function
102	V_{DD}	I	Power supply terminal
103	SRPR	O	Recording/playback select signal (REC: "H", PLAY: "L")
104	SRWND 2	O	ATF area det. signal
105	SRWND 1	O	Track pitch signal
106	PBDT	I	Playback signal
107	PBCK	I	Playback envelope signal
108	RFMSK	O	Not used, open
109	PLLOFS	O	PLL off-set information signal
110	HFCH	O	System clock signal
111	VFPLFS	O	PLL OFS effective information signal
112	EXFCH	—	Not used, connected to GND
113	EEMD	—	Not used, connected to GND
114	V_{SS}	—	GND terminal
115	SL NRZI	—	Not used, connected to GND
116	SELF CH0		
117	SELF CH1		
118	V_{DD}	I	Power supply terminal
119	M9CP	O	Master clock signal
120	HSW	I	Head switching signal
121	NR TRST	—	Not used, connected to power supply
122	SUBWND	—	Not used, open
123	IPF	O	Output terminal for flag counter
124	SUBC 1		

● Q551(74HC74): Dual D-FF



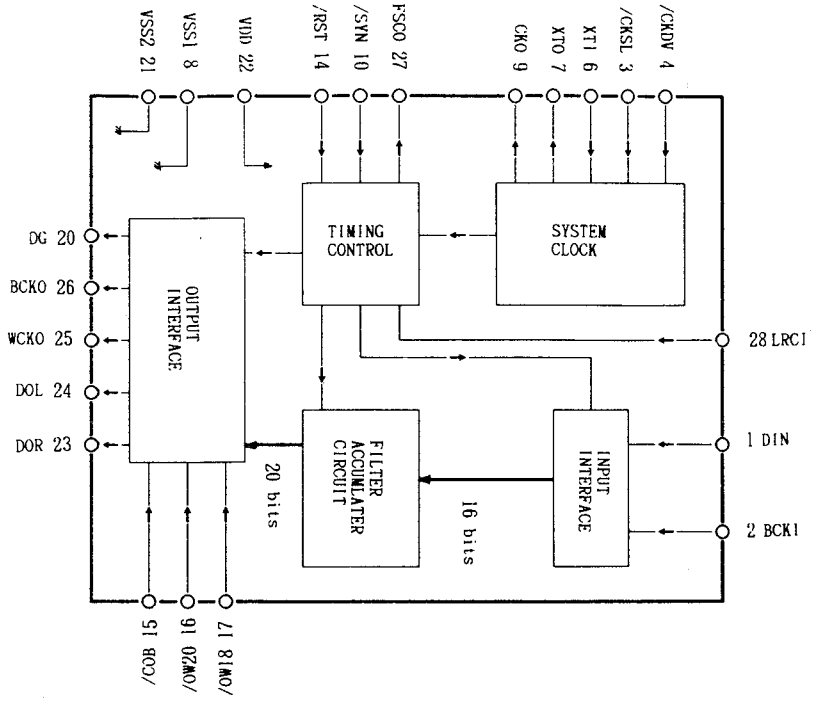


• Q302 (MN188161SDS4): System control

Pin No.	Mark	I/O Division	Function
1	V_{DD}	I	Power supply terminal
2 ⟆ 9	P 67 (SPDT 7) ⟆ P 60 (SPDT 0)	I/O	Signal processor transfer address and data bus terminal
10	P 57 (SPRDY)	I	Signal processor data transfer command signal
11	P 56 (PBLANK)	I	Blank skip select ("H": no skip, "L": skip)
12	P 55 (R3CP)	I	Frame sync. signal
13	P 54 (PMID6B)	—	Main ID6 select terminal
14	P 53 (PMID6A)		
15	P 52	I	Not used, connected to resistor
16	P 51	I	Not used, connected to resistor
17	P 50 (PDIOSEL)	I	D I/O select ("H": AES/EBV, "L": IEC)
18	EXI	—	Not used, connected to GND
19	EXO	—	Not used, open
20	NRST 1	I	Reset signal ("L": RESET)
21	P 47 (NSERVRST)	O	Reset signal to servo block
22	P 46	—	Not used, open
23	P 45	—	
24	P 44	—	
25	P 43 (SLAD)	O	DIGITAL IN PLL/crystal select terminal ("L": PLL, "H": crystal)
26	P 42 (XCK32)	O	32kHz OSC control ("H": OSC, "L": STOP)
27	P 41 (XCK44)	O	44.1kHz OSC control ("H": OSC, "L": STOP)
28	P 40 (XCK48)	O	48kHz OSC control ("H": OSC, "L": STOP)
29	P 27 (NPRDY)	I	Transfer ready signal from panel control
30	OSC 1	I	Crystal OSC terminal
31	OSC 2	O	
32	V_{SS}	—	GND terminal
33	XI	—	Not used, open
34	XO	—	
35	P 26	—	Not used, connected to power supply
36	P 25 (RF ENV)	I	RF envelope signal

Pin No.	Mark	I/O Division	Function
37	P 37 (FLGCLK)	O	Clock signal of flag counter
38	P 36 (FLGDT)	O	Data signal of flag counter
39	P 35 (TP)	O	Track pitch signal ("L": normal)
40	P 34 (UNLOCK)	O	DIGITAL-IN PLL unlock signal ("L": det.)
41	P 33	—	Not used, open
42	P 32 (DISCHG)	O	DIGITAL-IN PLL discharge signal
43	P 31 (DINPLINH)	O	DIGITAL-IN PLL prohibition signal ("H": prohibition)
44	P 30 (ANRST)	O	Reset signal ("H": RESET) to DAC
45	P 21 (HSW)	I	Head switching pulse signal
46	P 20 (NMRDY)	I	Transfer command signal from mechanism control
47	P 01	—	Not used, open
48	P 00	—	
49	P 17 (PTXD)	O	Serial data transmission terminal
50	P 16 (PRXD)	I	Serial data reception terminal
51	P 15 (PCLK)	O	Serial data transmission/ reception clock signal
52	P 14	—	Not used, open
53 ⟆ 56	P 13 (MDT 3) ⟆ P 10 (MDT 0)	I/O	Transfer data bus of mechanism control
57	P 77	—	Not used, open
58	P 76 (NDEMP)	O	de-emphasis signal
59	P 75 (SGMTG)	O	Muting signal
60	P 74 (DOUTTH)	O	Digital out through select ("H": through)
61	P 73 (NRST 2)	O	Reset signal
62	P 72 (MSTB)	O	Transfer command terminal of mechanism control
63	P 71 (SPSTB)	O	Signal processor strobe signal
64	P 70 (SPAW)	O	Signal processor address setting signal

● Q552(SM5831AP): 18bits oversampling digital filter



Pin No.	Terminal	I/O	Function
1	DIN	I	Input data
2	BCKI	I	Bit clock of input data
3	/CKSL	I	Input frequency selection terminals of
4	/CKVD	I	terminal XTI (Pin 6)
6	XTI	I	Input section of oscillator section
7	XTO	O	Output section of oscillator section
8	Vss1		Ground terminal
9	CKO	O	Output clock of oscillator section The frequency is same as XTI
10	/SYN	I	Mode selection terminal H:Jitter free L:Forced sync.
14	/RST	I	System reset H:Normal L:Reset
15	/COB	I	H:Complement of 2 L:COB
16	/OW20	I	Output bit numbers selector
17	/OW18	I	
20	DG	O	Deglith control clock
21	Vss2		Ground terminal
22	V_{DD}		Power supply terminal (+5V)
23	DOR	O	8-times oversampling output data of right channel
24	DOL	O	8-times oversampling output data of left channel
25	WCKO	O	Word clock of output data
26	BCKO	O	Bit clock of output data
27	FSCO	O	Internal accumlater timing clock of period fs.
28	LRCI	I	Sample rate clock of input data

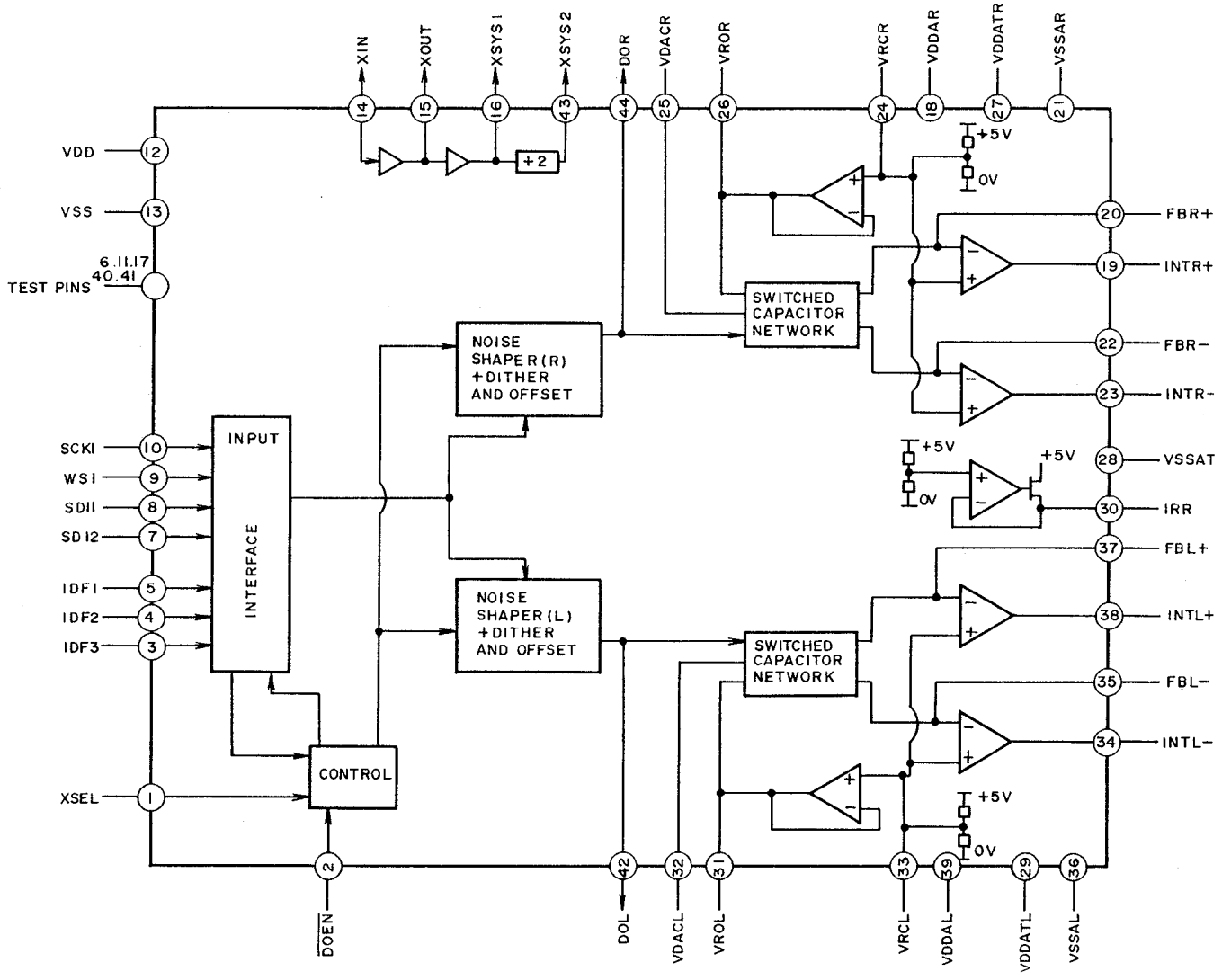
Output bit numbers

Output bit	16	18	20
/OW18	H	L	H
/OW20	H	H	L

● Q401(CXP50116-343Q): Panel control

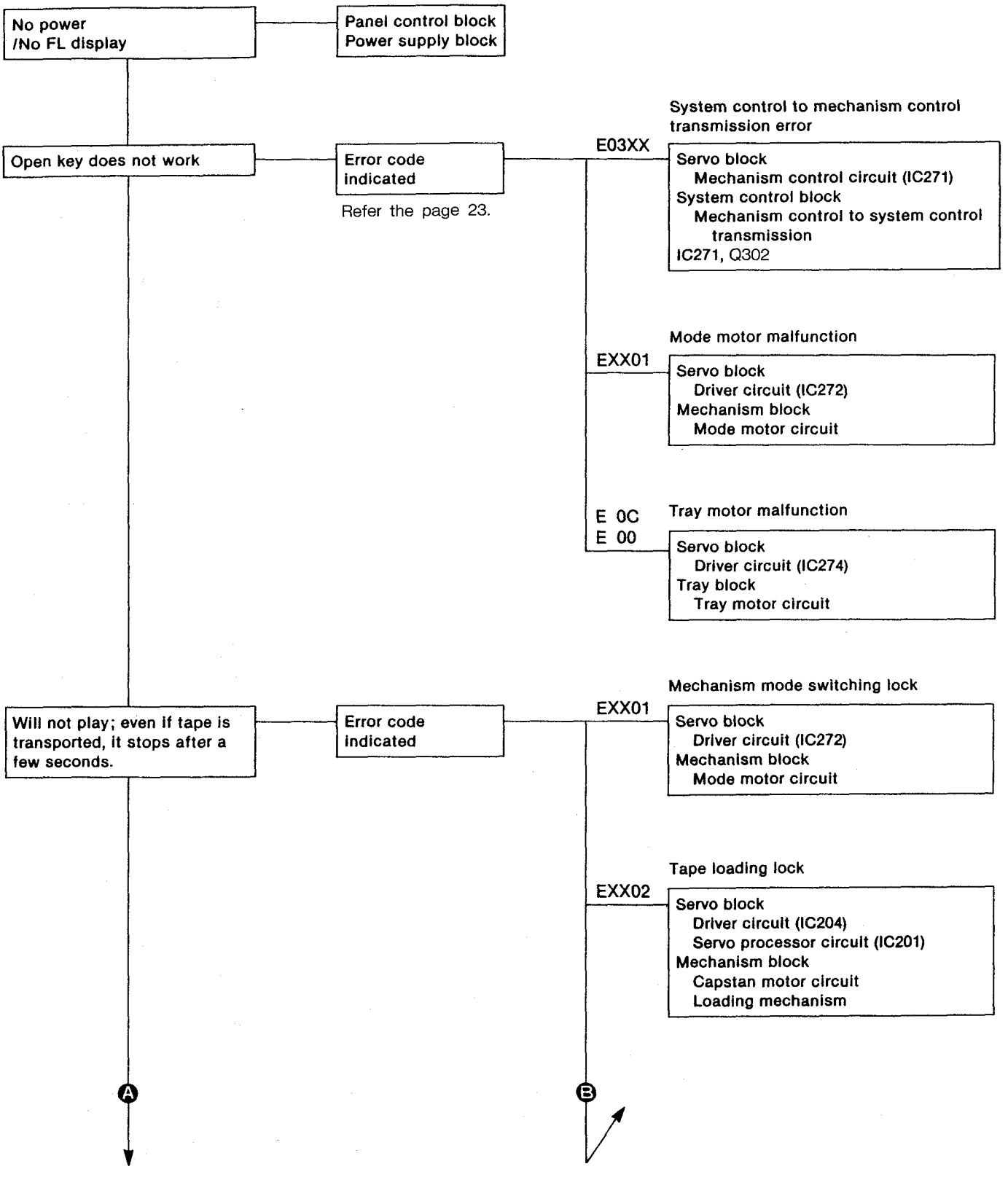
Pin No.	Mark	I/O	Function	Pin No.	Mark	I/O	Function
1~11	P12~P1	O	Segment signal for FL drive	59	FS32K	O	Gain adjustment when fs is 32kHz.
12~20	P17~P24	O	Segment signal for FL drive	60	RI-OUT	O	Remote control code output
23~26	4G~1G	O	Digit signal for FL drive	61	RI-IN	I	Remote control code input
27,28	5G,6G	O	Digit signal for FL drive	62	REMOTE	I	Remote control signal input
29	INT	I	Detection for operation after recording	63	TAPE IN	O	Cassette IN indicator drive output.
30	TX	O	Not used.	64	PLAY	O	Play indicator drive output.
31	TEX	I	Connect to 5V.	65	ST-ID A	O	Start ID Auto indicator drive output
32	RST	I	Reset terminal.Active L.	66	SK.P.CA	O	Skip Play Cancel indicator drive output
34	5V		Power supply terminal	67	PAUSE	O	Pause indicator drive output
35~42	AD1~AD7	I	A/D ports for operation key input.	68	REC	O	Rec indicator drive output
43	EC	I	Connect to 5V through 10kohm.	69	DI.IN	O	Digital IN indicator drive output
44	SC	O	Transfer clock for the microprocessor	71	GND	O	Ground terminal
45	SO	O	Data input for the microprocessor.	72	XTAL	I	Master clock terminal (4.19MHz)
46	SI	I	Data input for the microprocessor.	74	EXTAL	O	Connect to the ceramic oscillator.
47	NPRDY	I	Transfer delay input for the microprocessor	75	VREF	I	Connect to 5V.
48	CAS.IN	I	Cassette detection input.	76	VFDP	I	Power supply for FL tube drive
49	DPD	O	Calibration output for A/D converter	77~80	P16~P13	O	Segment signal for FL drive
50	CUE/REV	O	Sound quality output when CUE/REVIEW				

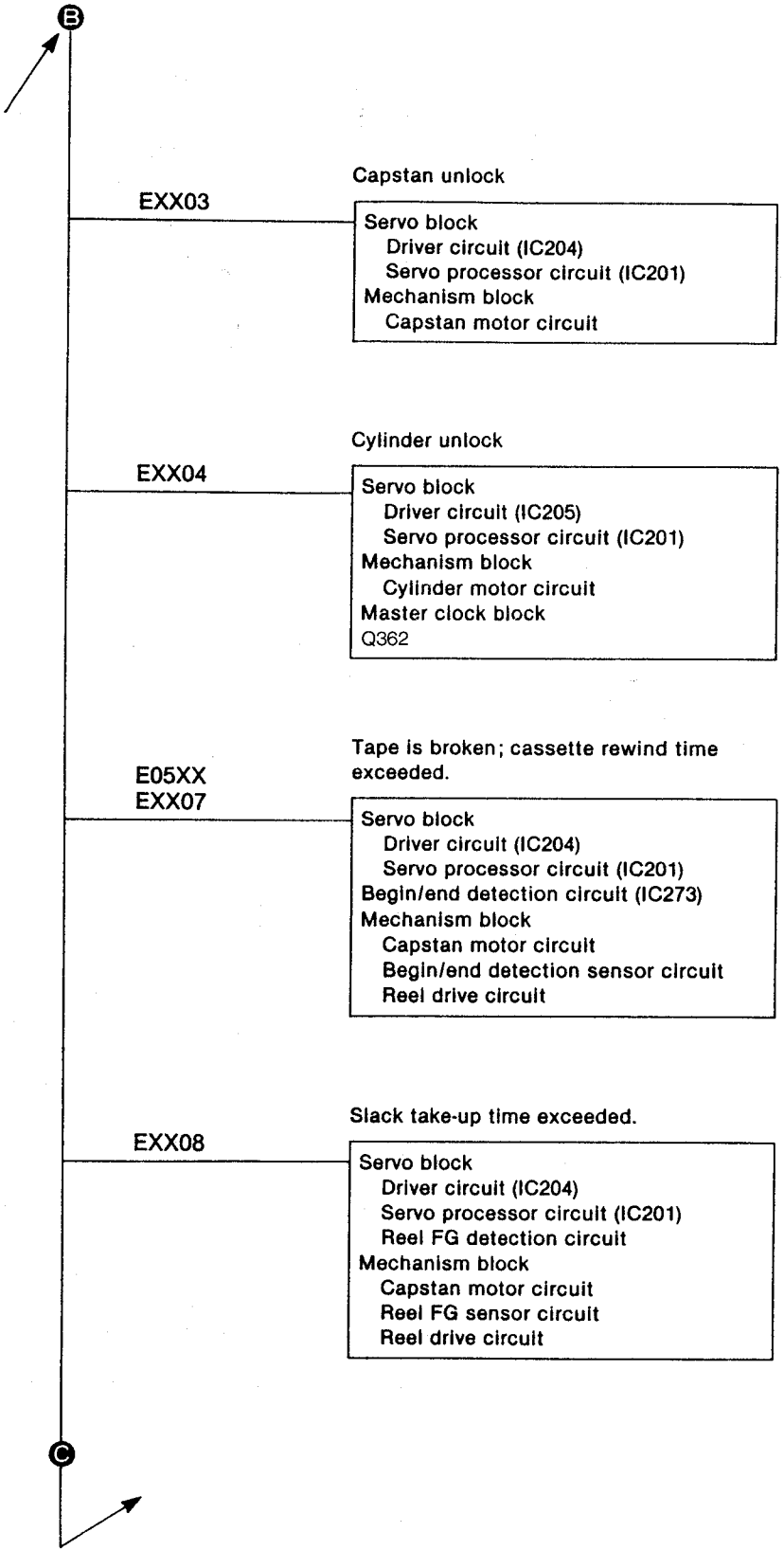
● Q553(SAA7350): D/A converter

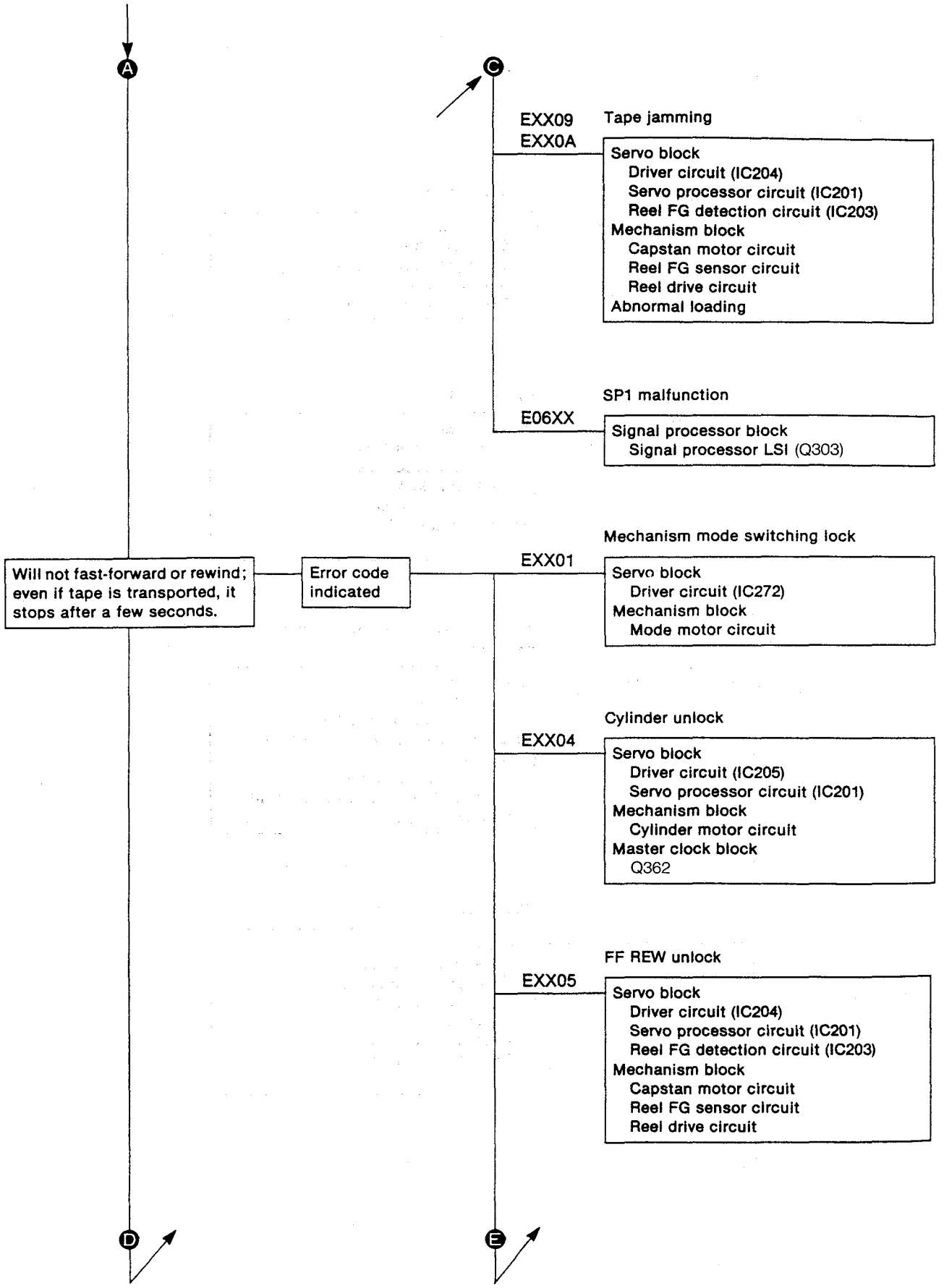


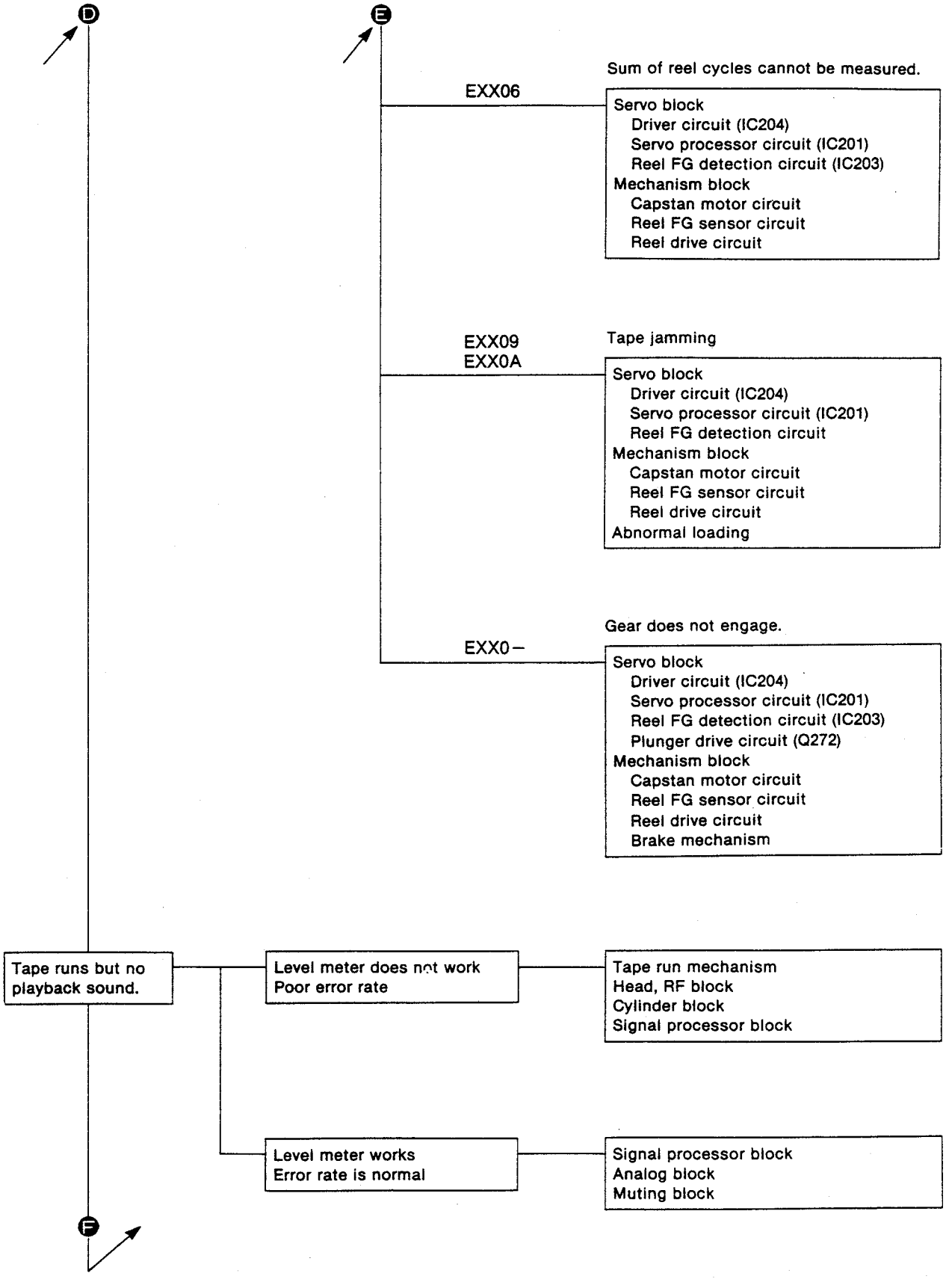
Pin No.	Mark	Function
1	XSEL	Crystal frequency select. This pin is used to select the master crystal frequency as follows:-XSEL HIGH=384fs XSEL LOW=256fs This pin defaults to XSEL HIGH when not connected.
2	DOEN	One-bit Digital Output Enable.When LOW,the one-bit code outputs are made available for DAC7. (not used.)
3	IDF3	Input data format.These three pins determine the input format
4	IDF2	the device is to operate in.If unconnected these pins will default
5	IDF1	HIGH(i.e. burst clock mode).
6	TEST4	This pin should be left open circuit.
7	SDI2	Serial Data Input.Used in simultaneous mode only (for the right channel signal). When not used,this pin will be internally pulled high.
8	SDI1	Serial Data Input.This should be a 16,18 or 20-bit linear 2's complement PCM signal. In simultaneous mode this pin is used for the left channel signal.
9	WSI	Serial input Word Select Signal.Signifies whether data word is for the left or right channel.Can be either fs,2fs,4fs or 8fs where fs is the system sampling frequency. fs can lie between 16kHz and 53kHz.
10	SCKI	Bit clock input for the serial input interface.
11	TEST1	This pin should be left open circuit.
12	VDD	5V power supply for digital section.
13	VSS	Ground connection for the digital section.
14	XIN	Crystal Oscillator Input.
15	XOUT	Crystal Oscillator Output.
16	XSYS1	Buffered Oscillator Output.
17	TEST5	In normal operation this pin should be tied LOW.
18	VDDAR	Analogue 5V supply for right channel.
19	INTR+	Output from the right positive switched-capacitor integrator.Input to differential op-amp.
20	FBR+	Feedback connection for the right positive switched-capacitor integrator.
21	VSSAR	0V supply for right channel.
22	FBR-	Feedback connection for the right negative switched-capacitor integrator.
23	INTR-	Output from the right negative switched-capacitor integrator.Input to differential op-amp.
24	VRCR	High impedance voltage reference for the right channel inputs.typically VDDAR/2.
25	VDACR	Reference voltage supply for right channel DAC's.Normally this will be connected to VSS.
26	VROR	Right channel voltage reference output.Typically VDDAR/2.
27	VDDATR	5V supply for right channel analogue timing.
28	VSSAT	0V supply for left and right channel analogue.
29	VDDATL	5V supply for left channel analogue timing.
30	IRR	24 kohm bias resistor connection for the reference current generator circuit.
31	VROL	Left channel voltage reference output.Typically VDDAL/2.
32	VDACL	Reference voltage supply for left channel DAC.Normally this will be connected to VSS.
33	VRCL	High impedance voltage reference for left channel inputs and for bias current generator. Typically VDDAL/2.
34	INTL-	Output from left negative switched capacitor integrated.Input to differential op-amp.
35	FBL-	Feedback connection for the left negative switched-capacitor integrator.
36	VSSAL	0V supply for left channel.
37	FBL+	Feedback connection for the left positive switched-capacitor integrator.
38	INTL+	Output from the left positive switched-capacitor integrator. Input to differential op-amp.
39	VDDAL	Analogue 5V supply for left channel.
40	TEST2	This pin should be left open circuit.
41	TEST3	This pin should be left open circuit.
42	DOL	Digital output left.Left channel one-bit code for DAC7,when disabled this pin will be driven LOW. (Not used.)
43	XSYS2	Output clock at a frequency of half the master clock frequency.
44	DOR	Digital output right.Right channel one-bit code for DAC7,when disabled this pin will be driven LOW. (not used.)

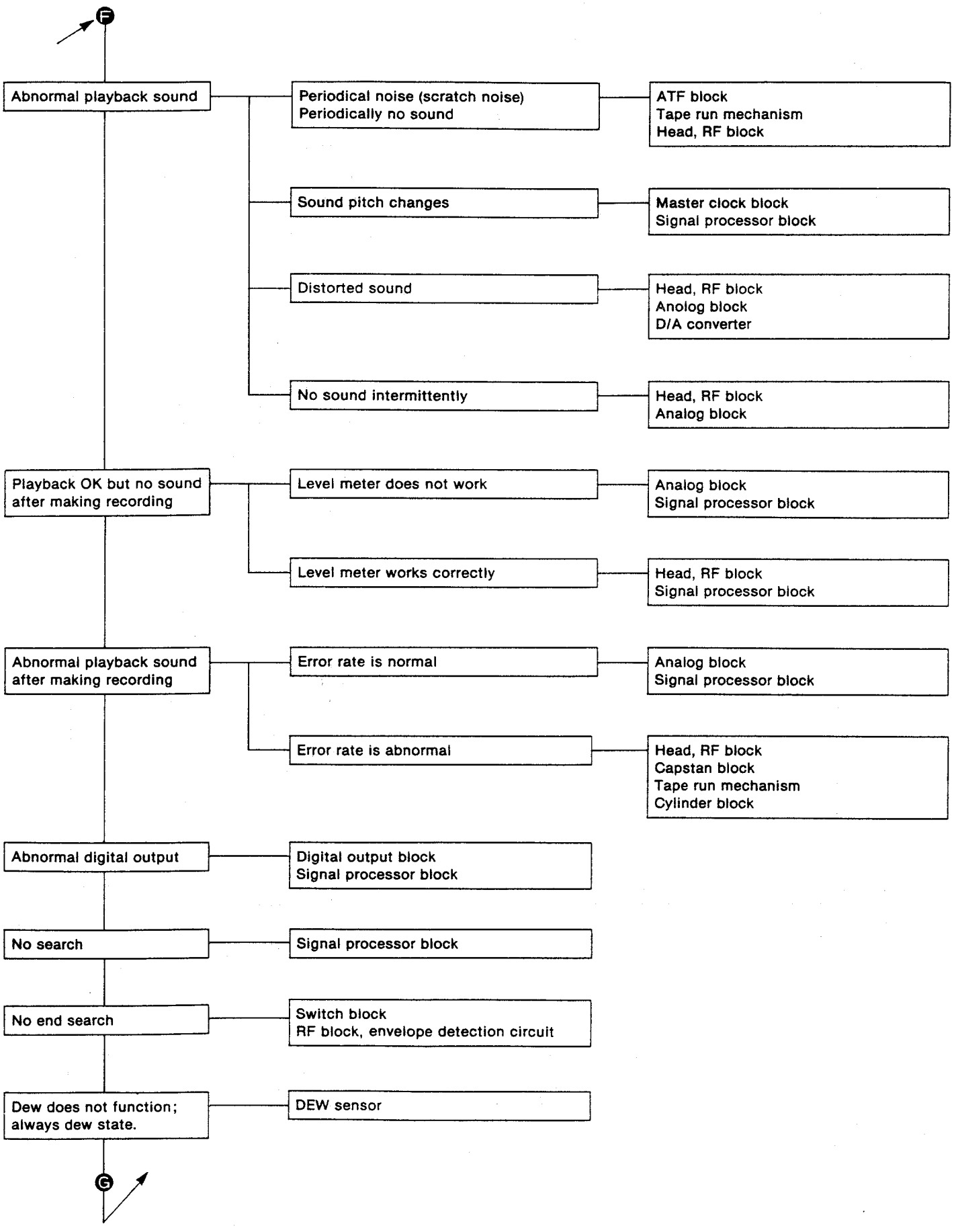
TROUBLESHOOTING GUIDE

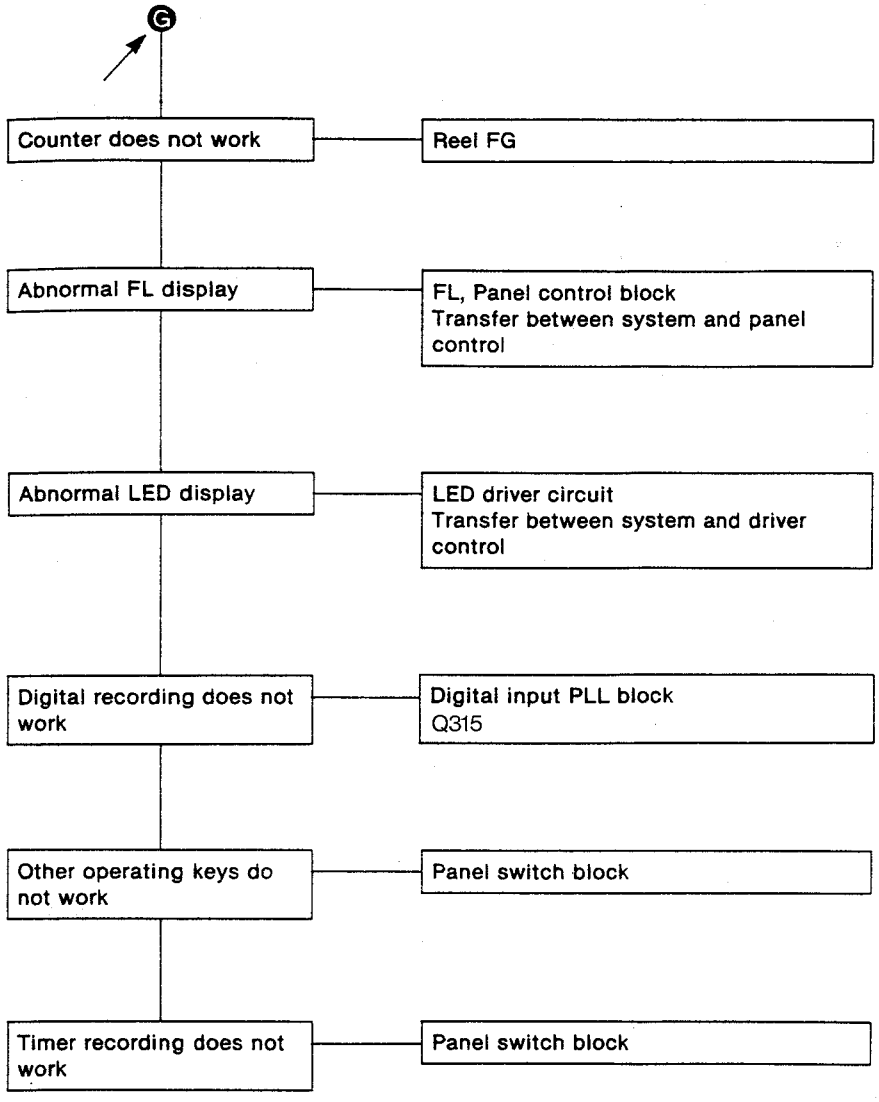



B
EXX03
Capstan unlock
Servo block
Driver circuit (IC204)
Servo processor circuit (IC201)
Mechanism block
Capstan motor circuit
EXX04
Cylinder unlock
Servo block
Driver circuit (IC205)
Servo processor circuit (IC201)
Mechanism block
Cylinder motor circuit
Master clock block
Q362
E05XX
EXX07
Tape is broken; cassette rewind time exceeded.
Servo block
Driver circuit (IC204)
Servo processor circuit (IC201)
Begin/end detection circuit (IC273)
Mechanism block
Capstan motor circuit
Begin/end detection sensor circuit
Reel drive circuit
EXX08
Slack take-up time exceeded.
Servo block
Driver circuit (IC204)
Servo processor circuit (IC201)
Reel FG detection circuit
Mechanism block
Capstan motor circuit
Reel FG sensor circuit
Reel drive circuit
C


A
C
EXX09
EXX0A
Tape jamming
Servo block
Driver circuit (IC204)
Servo processor circuit (IC201)
Reel FG detection circuit (IC203)
Mechanism block
Capstan motor circuit
Reel FG sensor circuit
Reel drive circuit
Abnormal loading
SP1 malfunction
E06XX
Signal processor block
Signal processor LSI (Q303)
Mechanism mode switching lock
Will not fast-forward or rewind; even if tape is transported, it stops after a few seconds.
Error code indicated
EXX01
Servo block
Driver circuit (IC272)
Mechanism block
Mode motor circuit
Cylinder unlock
EXX04
Servo block
Driver circuit (IC205)
Servo processor circuit (IC201)
Mechanism block
Cylinder motor circuit
Master clock block
Q362
FF REW unlock
EXX05
Servo block
Driver circuit (IC204)
Servo processor circuit (IC201)
Reel FG detection circuit (IC203)
Mechanism block
Capstan motor circuit
Reel FG sensor circuit
Reel drive circuit
D
E


D
E
Sum of reel cycles cannot be measured.
EXX06
Servo block
Driver circuit (IC204)
Servo processor circuit (IC201)
Reel FG detection circuit (IC203)
Mechanism block
Capstan motor circuit
Reel FG sensor circuit
Reel drive circuit
Tape jamming
EXX09
EXX0A
Servo block
Driver circuit (IC204)
Servo processor circuit (IC201)
Reel FG detection circuit
Mechanism block
Capstan motor circuit
Reel FG sensor circuit
Reel drive circuit
Abnormal loading
Gear does not engage.
EXX0–
Servo block
Driver circuit (IC204)
Servo processor circuit (IC201)
Reel FG detection circuit (IC203)
Plunger drive circuit (Q272)
Mechanism block
Capstan motor circuit
Reel FG sensor circuit
Reel drive circuit
Brake mechanism
Tape runs but no playback sound.
Level meter does not work
Poor error rate
Tape run mechanism
Head, RF block
Cylinder block
Signal processor block
Level meter works
Error rate is normal
Signal processor block
Analog block
Muting block
F


F
Abnormal playback sound
Periodical noise (scratch noise)
Periodically no sound
ATF block
Tape run mechanism
Head, RF block
Sound pitch changes
Master clock block
Signal processor block
Distorted sound
Head, RF block
Anolog block
D/A converter
No sound intermittently
Head, RF block
Analog block
Playback OK but no sound after making recording
Level meter does not work
Analog block
Signal processor block
Level meter works correctly
Head, RF block
Signal processor block
Abnormal playback sound after making recording
Error rate is normal
Analog block
Signal processor block
Error rate is abnormal
Head, RF block
Capstan block
Tape run mechanism
Cylinder block
Abnormal digital output
Digital output block
Signal processor block
No search
Signal processor block
No end search
Switch block
RF block, envelope detection circuit
Dew does not function; always dew state.
DEW sensor
G


G
Counter does not work
Reel FG
Abnormal FL display
FL, Panel control block
Transfer between system and panel control
Abnormal LED display
LED driver circuit
Transfer between system and driver control
Digital recording does not work
Digital input PLL block
Q315
Other operating keys do not work
Panel switch block
Timer recording does not work
Panel switch block

KEY POINTS FOR TROUBLESHOOTING

Mechanism block
- Loading mechanism
  - Post roller
  - Tension regulator
  - Pinch roller
  - Brake lever
- Brake mechanism
  - Brake lever
  - Solenoid
  - Solenoid driver
- Mechanism switch block
  - Tape hole detection switch
  - Cassette detection switch
  - Holder switch
- Reel FG block
  - Detection photo transistor
  - Detection LED
  - Reel FG amp (servo P.C.B.)
- FPC & FPC connector

Mode motor block
- Mode motor
- Mode switch
- Mode motor driver circuit

Master clock block
- 28MHz oscillator
- 16MHz, 22MHz, 24MHz oscillate and select circuit

Panel switch block
- Switch
- Panel control IC

Head, RF block
- Head FPC & FPC connector
- Head dirty
- Head cracked or damaged
- RF recording current
- Playback eye pattern

Tape begin/end detection block
- Begin/end detection photo transistor
- Begin/end detection LED
- Comparator circuit
- FPC & FPC connector

Power supply block
- Power supply regulator output
- Fuse

Capstan block
- Capstan FG
- FG amp
- Motor driver output
- Motor current

Cylinder block
- Cylinder FG
- Cylinder PG
- FG amp
- PG amp
- Motor driver output
- Motor current

ATF block
- RF ATF output
  - ATF SYNC output
- ATF select circuit
- ATF gate allay

Signal processor block
- Data & clock to D/A
- Data & clock to A/D
- All clocks

Digital output block
- Digital output PB

Panel control block
- Panel control block
- Transfer between panel and system control
- Panel control reset

Analog block
- Input amplifier
- Output amplifier
- Muting circuit
- A/D converter
- D/A converter

ABOUT THE ERROR RATE

If the error rate is normal, it can be judged that everything up to signal processing, meaning the operation of the RF head mechanism, is normal.
Thus, when there is a problem with playback, if the error is normal, it can be assumed that the origin of the problem is in the analog system.

ABOUT THE LEVEL METER

Just as for the error rate, if the level meter is operating normally, it indicates that the signal is reaching signal processing.
In other words, if there is no problem with the level meter during playback, it indicates that the head and the RF are outputting the signal.
In addition, if there is no problem with the level meter during recording, it indicates that the analog system (input amplifier and AD) is functioning normally.

ERROR DISPLAY AND PROBLEM LOCATION

Display procedure

Simultaneously press the counter mode key, the counter reset key, and the pause key. The various internal data will be indicated in the counter section of the fluorescent lamp display.

There are four types of data as shown below; the data indicated will change each time the counter mode key is pressed.

① Total error rate for head A and head B.	"A" and "B" will light up in the repeat indication of the fluorescent lamp display.
② Error rate for head A	"A" will light up in the repeat indication of the fluorescent lamp display.
③ Internal code for microcomputer processing	
④ Error codes for system control (left) and mechanism control (right) (Refer to the next page.)	"E" will light up in the farthest left digit of the counter.

To return to the normal display mode, press the counter reset key.
Note that the error codes will be cleared when the tray is opened.

ERROR CODE TABLE

Error code (Note. 1)	System control error code		Mechanism control error code	
	Processing (Note 2)	Contents	Processing (Note 2)	Contents
1	Test operation	R3CP clock malfunction	Unload	Mechanism mode switching lock
2	Test operation	HSW clock malfunction	Unload	Tape loading lock
3	Transmission omitted	Faulty transmission of the mechanism control	Unload	Capstan unlock
4	Unload	Still protection during operation	Unload	Cylinder unlock
5	Unload	Broken tape	Unload	Reel unlock
6	Unload	Faulty transmission of SP1	Unload	Sum of reel cycles cannot be measured.
7			Unload	In-cassette rewind time exceeded.
8			Unload	Slack tape-up time exceeded.
9			Unload	Tape jamming (Supply side)
A			Unload	Tape jamming (Take-up side)
B (−)			Unload	Gear does not engage.
C			Tray stop	Initial tray setting not possible.
O		——		No error
FF (blank)		No error		——

Note 1: Display mode

E	X1	X2

E: Indicates that mode is the error rate display mode.
X1: System control error code
X2: Mechanism control error code

Note 2: Processing when an error occurs

Test operation:
Internal clock of the system control temporarily connects for operation.

Transmission omitted:
Transmission processing stopped.

Unload:
Tape is unloaded.

DAT MAINTENANCE CHART

• DAT Head and Tape Transport Cleaning

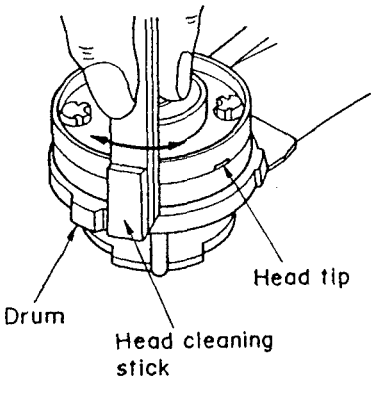
Through normal usage of any tape machine, dirt and debris from the tape accumlates on the heads, which eventually causes performance problems. By using a cleaning cassette regularly, dirt buildup can be minimized, prolonging the line of the tape heads, and also keeping tape posts, tape guides, and the pinch roller clean.

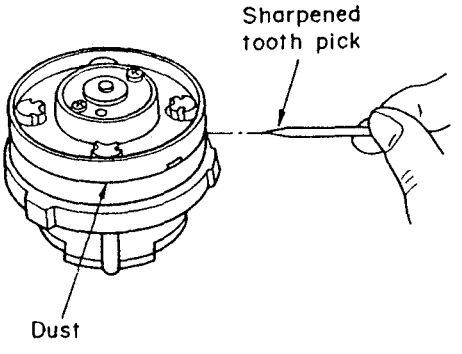
• CLEANING

1. Play the cleaning cassette for 15-20 seconds.
2. Do not use the same part of the cleaning tape more than once.
3. Clean all tape contact surfaces, including the upper and lower drum, thoroughly with a soft cloth soaked in alcohol.
4. Clean both heads by gently rubbing in a horizontal direction, as depicted, using a head cleaning stick or a lint free cloth moistened with alcohol.
5. Wipe all tape contact surfaces, including upper and lower drum, with a dry soft cloth to ensure that all residual moisture is removed from the tape contact surfaces.

Note:

1. When cleaning the upper drum, hold it secure by the top edges with your finger tips.
2. Occasionally, dirt or debris may become lodged in the air bearing channels that are cut in the upper drum's surface. This can be removed by gently dislodging it with a sharpened toothpick.
3. The amount of solvent applied to the head drum should be used in moderation. Excess alcohol will dilute and remove the bearing lubricant in the capstan motor and rotary guides.



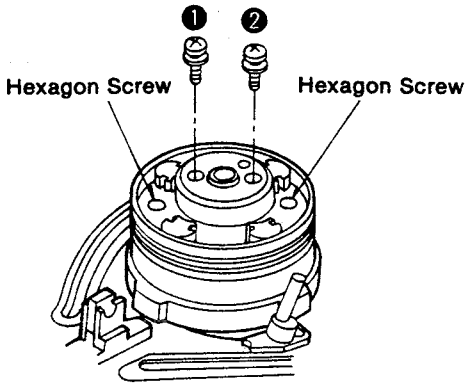


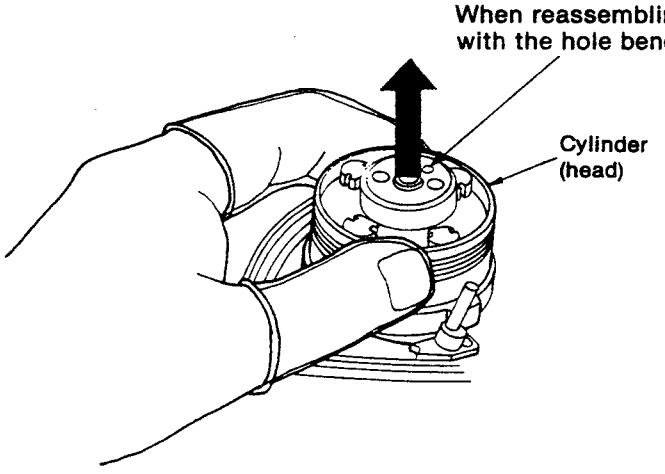
• MECHANISM CONTROLS AND FUNCTIONS

① LIGHT HOUSE TYPE RADIATION LED	Lighthouse-shaped, LEDs blink at start and end of tape.
② CYLINDER	30mm in diameter, 40 FG pulses, maintains specified speed of 1000 to 3000rpm.
③ T. POST ROLLER	Regulates tape travel position (upper edge).
④ T. INCLINED BASE (FIXED)	Regulates angle (90°) at which tape is wound around cylinder (stationary).
⑤ T. STOPPER	Determines position of T post roller base during loading.
⑥ LOAD SW	Two-bit rotary switch, detects loading position.
⑦ PINCH ROLLER	Presses against tape during play and review.
⑧ T. FIXED POST	Regulates tape travel position.
⑨ CAPSTAN MOTOR	1.5mm in diameter, 290 FG pulses.
⑩ LOAD HOLDER	Contains loading drive gear and worm gear, engages and disengages M gear A.
⑪ T. GUIDE ROLLER	Regulates tape travel position (top edge).
⑫ DATUM PIN	Regulates width and height (right side) during loading of cassette tape.
⑬ GUIDE ARM STOPPER	Determines position of T guide roller base K during loading.
⑭ LOAD SELECT LEVER	Switches engagement and disengagement of loading gear in accordance with loading conditions.
⑮ BEGIN DET. SENSOR	Light-receiving element for LED (detection at start of tape).
⑯ PINCH LEVER	Presses pinch roller against tape during play and review.
⑰ GUIDE LINK	Links T post roller base and guide roller base.
⑱ PINCH ARM	Comprised of pinch roller and T holding post, presses against the capstan.
⑲ PIN-PRESSURE LINK	Connected by the pin pressure spring and the pinch arm.
⑳ T. REEL (TAKE UP SIDE)	Take-up reel base, 64 FG pulses.
㉑ CASSETTE SW	Detects cassette information (mistaken erasure, cassette detection).
㉒ T. BRAKE	Presses brake gear against reel base gear to perform braking.
㉓ IDLER GUIDE	Holding cover for idler arm and S and T brakes.
㉔ IDLER ARM	Moves left or right in accordance with mode condition, transmits movement of counter gear to S and T reels.
㉕ IDLER GEAR	Transmits movement to S and T reels in accordance with mode.
㉖ BT LEVER	Applies back tension to T reel during review.
㉗ BT SPRING	Provides pressure for back tension lever.
㉘ S. BRAKE	Presses brake shoe against S reel base gear to perform braking.
㉙ S. REEL (SUPPLY SIDE)	Supply reel base, 64 FG pulses.
㉚ MODE MOTOR	6.5V DC motor, switches mode by forward and reverse revolution.
㉛ TENSION SPRING	Provides back tension force of tension regulator.
㉜ TENSION BAND	Mounted to tension regulator, applies back tension to S reel base.
㉝ TENSION ARM	Detects tape condition and applies back tension during play and review.
㉞ END DET. SENSOR	Light-receiving element for LED (detection at end of tape).
㉟ DATUM PIN	Regulates width and height (left side) during loading of cassette tape.
㊱ LID OPENER	Opens cassette lid during loading of tape.
㊲ S. GUIDE ROLLER	Regulates tape travel position (bottom edge).
㊳ S. FIXED POST	Regulates tape travel (bottom edge).
㊴ S. POST ROLLER	Regulates tape travel position (top edge).
㊵ S. STOPPER	Determines position of S post roller base during loading.
㊶ LOADING CAM	Uses movement transmitted from loading worm to move loading lever.
㊷ LOADING WORM	Transmits movement of loading drive gear and loading cam.
㊸ LOAD DRIVE GEAR	Transmits movement of M gear A and loading worm, engages and disengages in accordance with mode.
㊹ MR DET. ELEMENT	Detects magnetic changes (290 pulses) of flywheel.
㊺ PINCH ROLLER SPRING	Mounted to the pinch arm, returns the pinch roller.
㊻ LOAD GUIDE HOLDER	Holding cover of the loading arm and loading lever.
㊼ MODE GUIDE PLATE	Holding cover of the various gears, holds the plunger in position.
㊽ BRAKE PLUNGER	5V, 200mA, switches brakes on and off in accordance with the mode.

• REMOVAL OF THE UPPER CYLINDER

Remove the loading unit
(Refer the page 30)



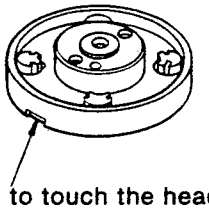


1. Remove the 2 screws (❶, ❷).

Caution: Please do not touch Hexagon screws.

2. Remove the cylinder (head) in the direction of the arrow.

   Note: Do not touch the cylinder (head) with your bare hand; always be sure to wear a glove or other protection.

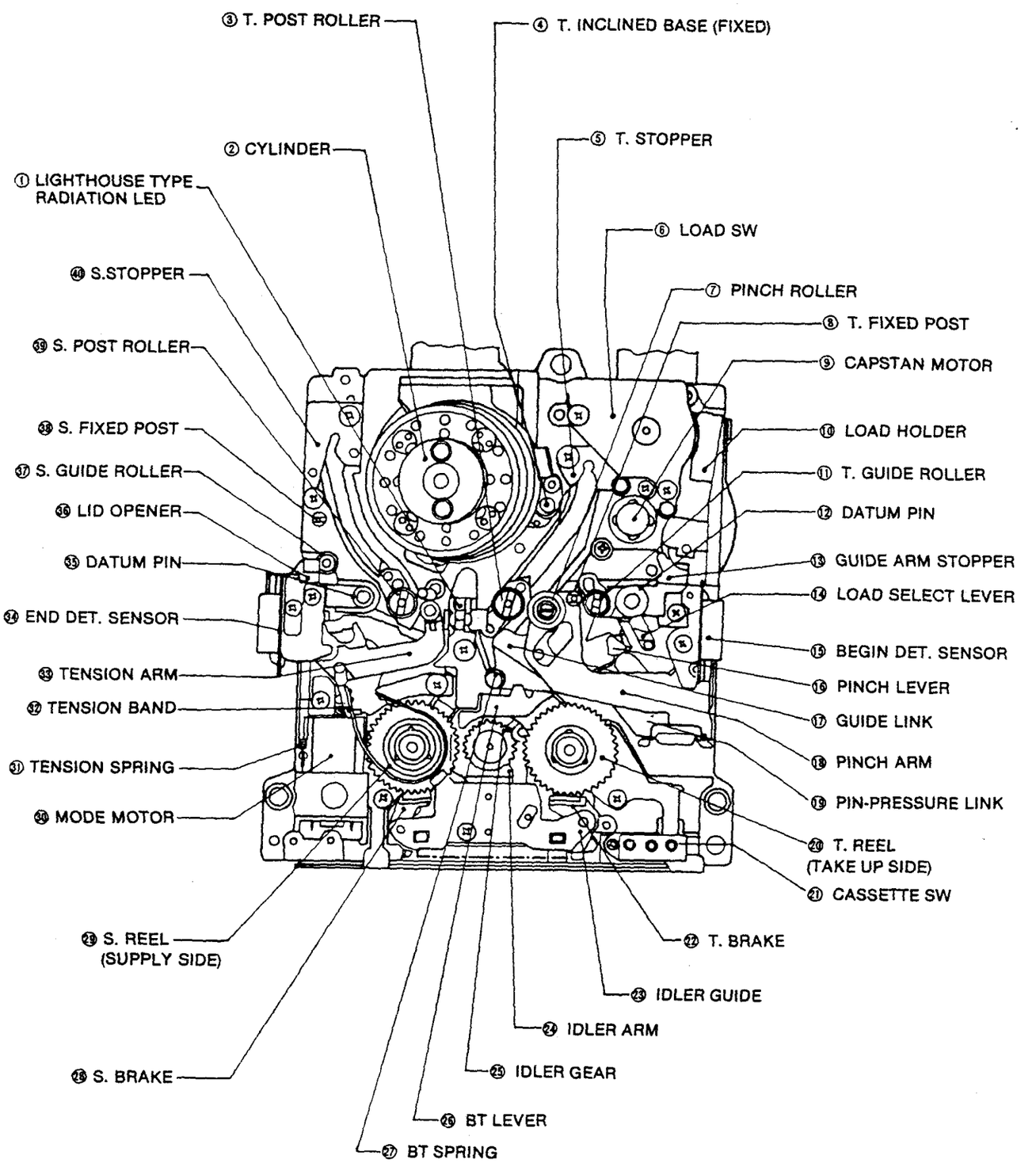


Be sure not to touch the head part.

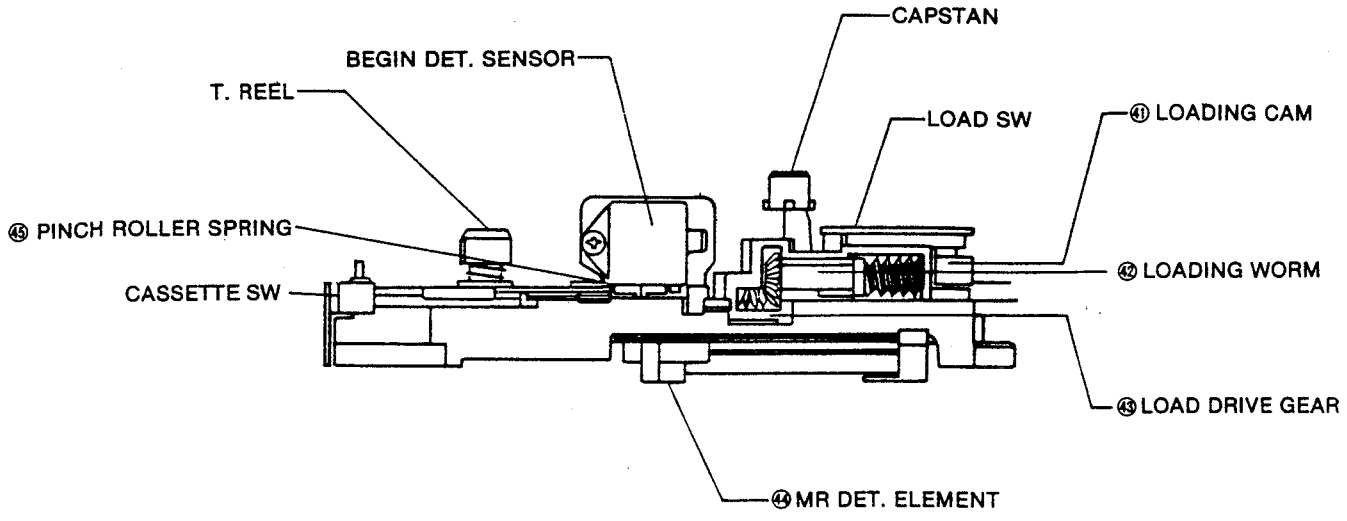
* When reassembling the cylinder (head), be sure that the direction is correct. (If it is assembled in the wrong direction, the left and right channels will be reversed during recording and playback.)

• MECHANISM COMPONENT LAYOUT

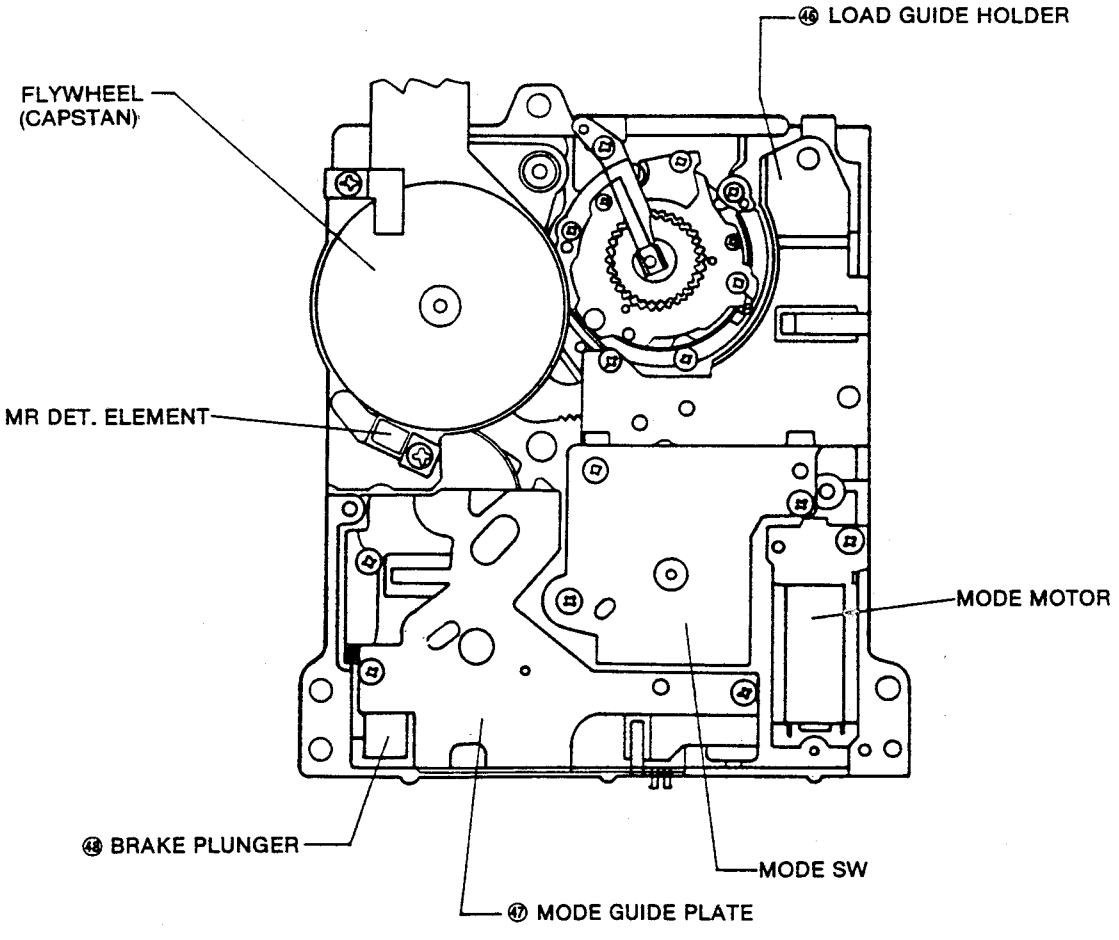
• Top view



• **Side view**



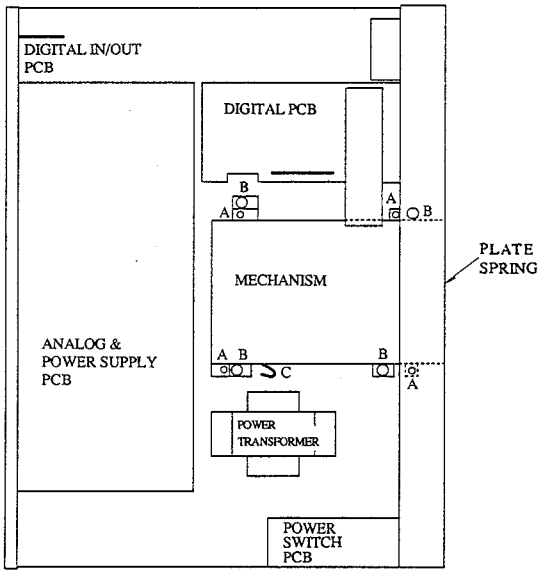
• **Bottom view**



ADJUSTMENT PROCEDURES

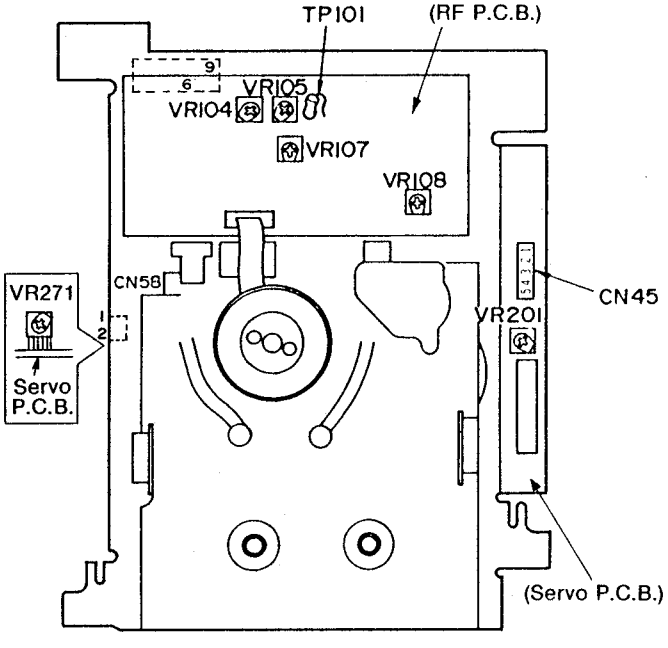
• PREPARATION

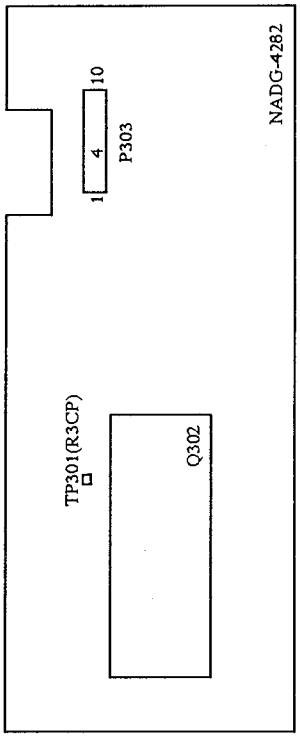
(1) Remove the top cover and the side panels.
(2) Remove the front panel.
(3) Remove the plate spring on the center of the front bracket.
(4) Remove the four screws A and loosen the clamper C.
(5) Remove the loading unit.
Note: Refer the preparation of page 34.



• ELECTRICAL ADJUSTMENT

• Adjustment points

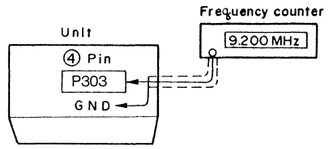




Equipment and Tools
- 2-channel 30MHz oscilloscope (with external trigger and delay sweep) (with a 10 : 1 probe)
- Standard electrical tools and equipment
- Standard test tapes – RD-PG01 (PG reference), RD-ER01 (error rate)
- Blank tape for recording and playback (commercially available blank tape)
- Linearity adjusting tape: RD-LR02
- Post roller adjusting screwdriver: SZZV1102C
- Frequency counter

1. PLL Free Run Adjustment

1. Test equipment connection is shown in figure.
2. Power switch in "on" position.
3. Set the unit to cassette holder in "open" position.
4. Adjust **VR108** for **9.2±0.2MHz** on frequency counter reading.

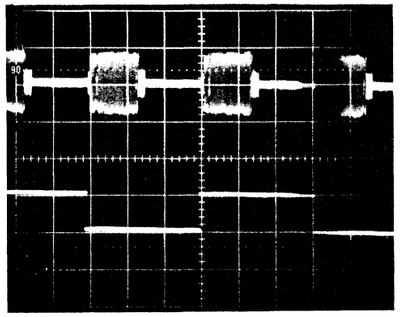


2. PG Phase Adjustment

1. Play the PG reference portion of the standard test tape (RD-PG01).
2. Set up the oscilloscope and connect as shown below.

	CH-1	CH-2
Test point	**TP101 (RPRF)**	**TP301 (R3CP)**
Volts/Div.	50mV	0.5V
Time/Div.	5msec.	
Delay	50µsec.	
Trig.	CH-2	
Mode	CHOP	
AC-GND-DC	AC	DC
Adjustment point	**VR201**	

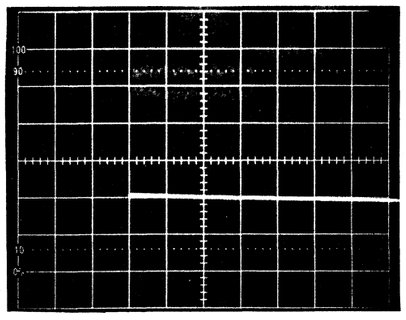
Note: GND is the shield plate of the RF circuit.

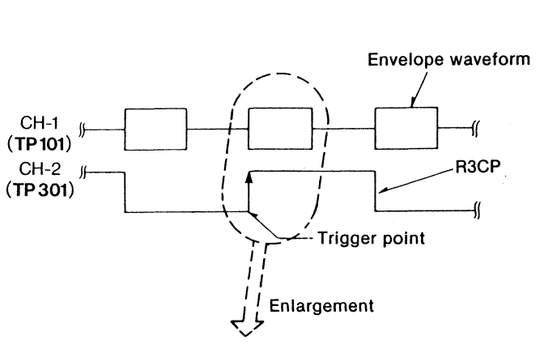


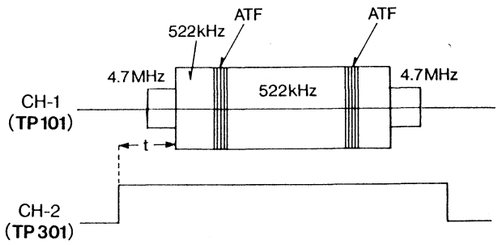
3. After set up, the waveform shown on the right appears.
4. The waveform in the figure on the right is enlarged using the delayed sweep. The point where the delayed sweep is used to enlarge the waveform is the leading edge of the CH-2 (R3CP) waveform.

   Delayed sweep — 50µsec.

5. Adjust **VR201** (located on the servo P.C.B.) so that the time "t" (in the figure below) from the leading edge of the waveform of CH-2 to the leading edge of the 522kHz waveform of CH-1 it is within **±40µsec** of the time indicated on the label of the standard tape (e.g. **170µsec**).







t: Value (µsec) indicated on the standard tape ±40µsec.

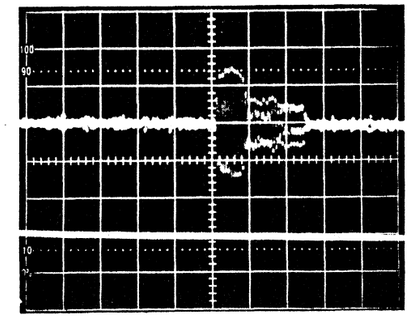
3. ATF Gain Adjustment

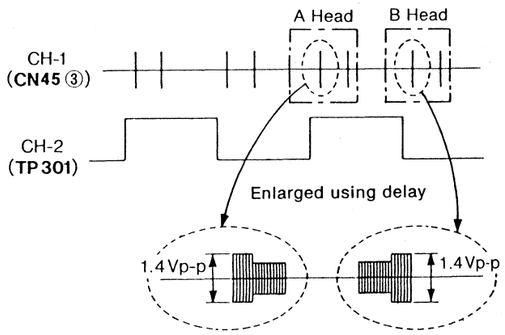
1. Play the **error rate measurement** standard test tape (RD-ER01).
2. Set up the oscilloscope and connect as shown below.

	CH-1	CH-2
Test point	**CN45 ③ (PILOT)**	**TP301 (R3CP)**
Volts/Div.	50mV	0.5V
Time/Div.	5msec.	
Delay	0.1msec.	
Trig.	CH-2	
AC-GND-DC	AC	DC
Adjustment point	**VR107**	

3. Monitor about 8 lines of the ATF waveform. Select the line with the largest amplitude and enlarge it using the 50µsec. delayed sweep.
4. Adjust **VR107** so that the amplitude of the waveform is **1.4Vp-p** check that the other smaller amplitudes are **1.2Vp-p** or higher.

Standard value: 1.4±0.2Vp-p





4. RF Recording Level Adjustment

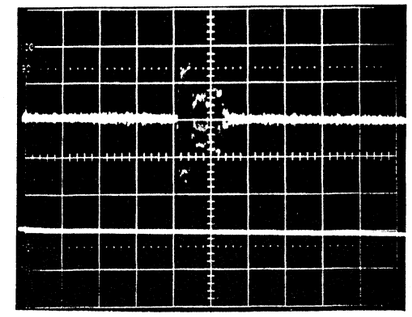
1. Load a blank tape into the unit, place the unit in the REC-play mode, and make a blank signal recording for 10 to 15sec. Rewind the tape and play back the recorded portion.
2. Connect and set up the oscilloscope as follows:

	CH-1	CH-2
Test point	**CN45 ③ (PILOT)**	**TP301 (R3CP)**
Volts/Div.	50mV	0.5V
Time/Div.	2msec.	
Delay	0.2msec.	
Trig.	CH-2	
AC-GND-DC	AC	DC
Adjustment point	**VR104**: Head A, **VR105**: Head B	

3. While playing back the erased portion of the tape, verify that the signal amplitude falls in the range of **1.4±0.2Vp-p**.

Standard value: 1.4±0.2Vp-p

4. If the signal amplitude is less than **1.2V**, turn **VR104** (head A) or **VR105** (head B) counter-clockwise until the amplitude falls into the specification. If it exceeds **1.4V**, turn the same variable resistors clockwise until the specification is met.
5. Repeat step 2 above again, then verify that the playback signal amplitude falls in the range specified in step 3.
   (Repeat step 2, 3 and 4 above until the specification is met.)



5. BOT/EOT Detection Sensitivity Verification and Adjustment

Remove the four screws B.
Remove the Mechanism ass'y.

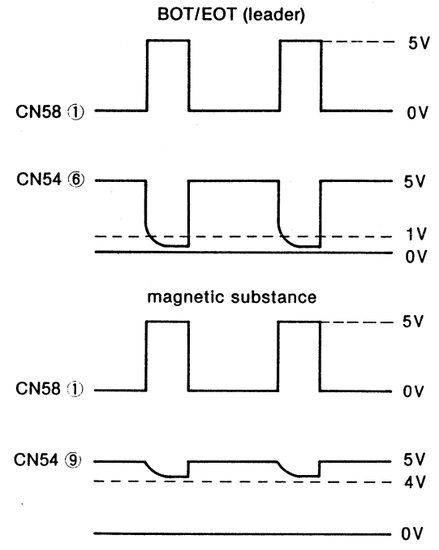
1. Make sure that the tape stops with the leader portion (the beginning and ending portion).

※ If the tape does not stop at the leader, make adjustment by following procedure outlined below.

①Insert a blank tape into the tape compartment of the set and press the playback button at the end of the tape.

②Set up the oscilloscope and connect as shown below.

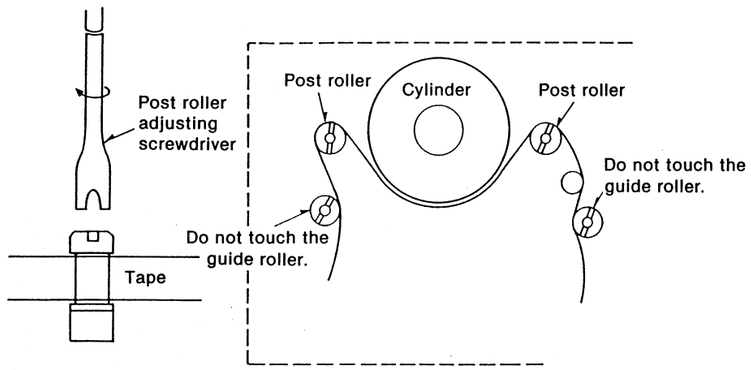
	CH-1	CH-2
Test point	**CN54** ⑥ (BOT/EOT) ⑨ (magnetic substance)	**CN58** ①
Volts/Div.	0.2V	0.2V
Time/Div.	2msec.	
Delay	——	
Trig.	CH-2	
AC-GND-DC	AC	DC
Adjustment point	**VR271**	



③Adjust the amplitude of waveform to less than **1V** at the magnetic substance and more than **4V** at the leader on **VR271**.

6. Linearity Adjustment

Caution: The post rollers are used for linearity adjustment. Gradually change the post roller heights until the RF signal envelope becomes rectangular.



• DAT Linearity Adjustment

1. Load the linearity adjusting tape (RD-LR02) into the deck.
2. Connect and set up the oscilloscope as follows:

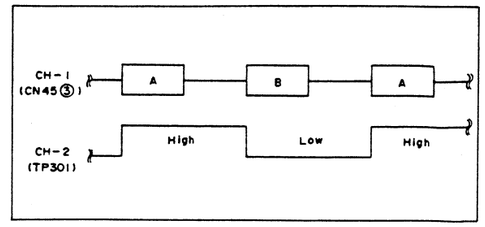
	CH-1	CH-2
Test point	**CN45 ③ (PILOT)**	**TP301 (R3CP)**
Volts/Div.	0.2V	2.0V
Time/Div.	Ⓐ 5msec. Ⓑ 1msec. Ⓒ 0.2msec.	
Delay	——	
Trig.	CH-2	
AC-GND-DC	AC	DC
Adjustment point	**Post rollers**	

3. Monitor the head "A" side of RF envelope waveform.

Note: When the waveform of TP301 (R3CP) is high, the envelope is output from the head "A".

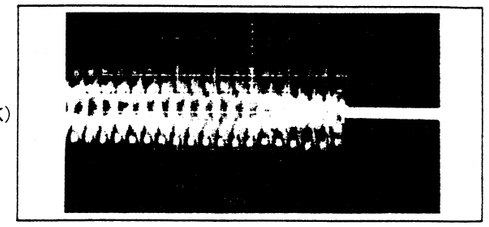
4. While playing back the linearity adjusting tape, gradually adjust the **post roller** heights until the RF signal envelope Ⓑ becomes rectangular.

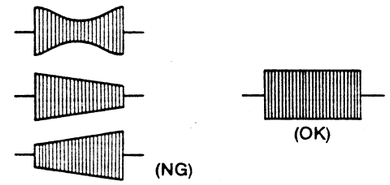
Ⓐ



Ⓑ

(OK)

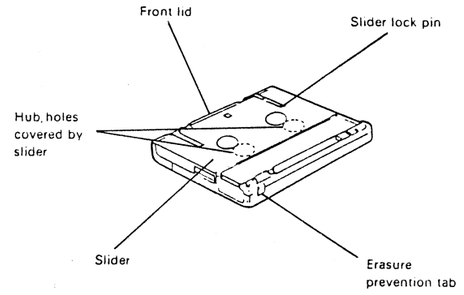




■ If the loading unit is to be removed for adjustment, note the following.

(PREPARATIONS)

(1) Remove the loading unit. (With the underside facing up.)
(2) Open the cassette holder.
(3) Move the slider opening/closing plate of the removed loading unit in the direction indicated by the arrow in Fig. 1, and hook it above the prong of the reinforcement plate.
Caution: The slider opening/closing plate will be deformed if it is left as is.
(4) Place a tape with the slider lock released in the mechanism.
(5) Switch on the power and check the loading operation.



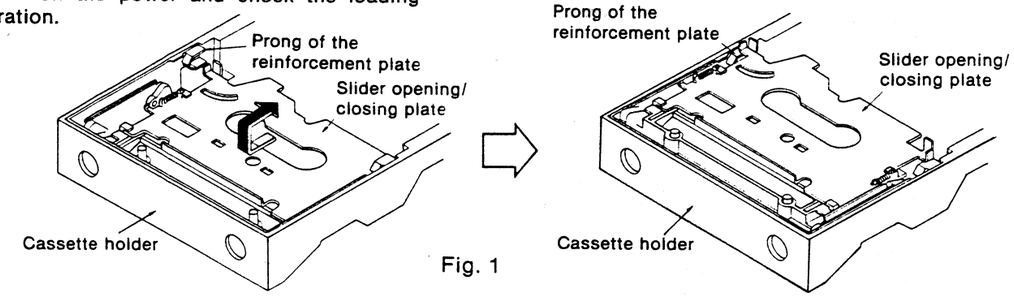
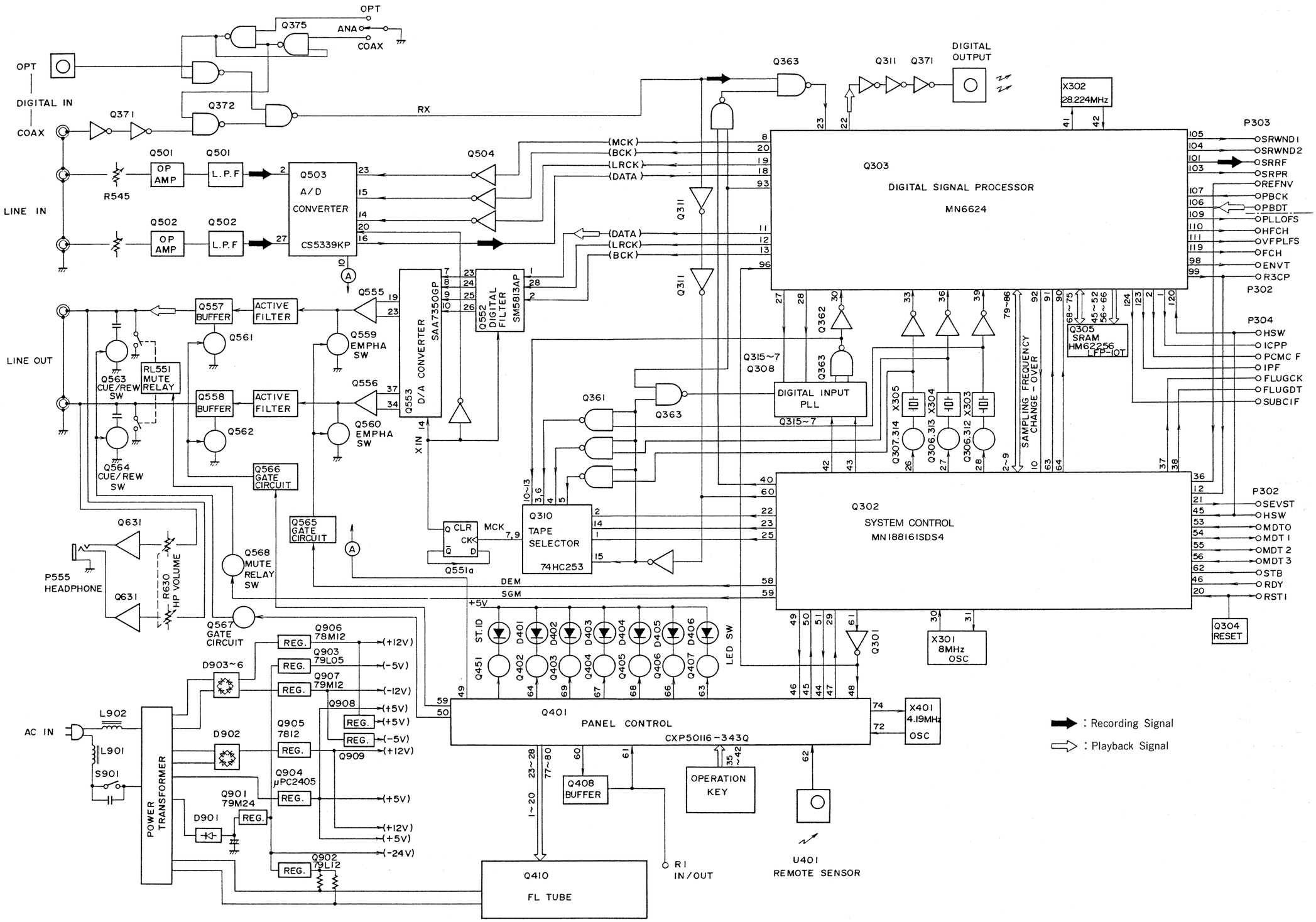
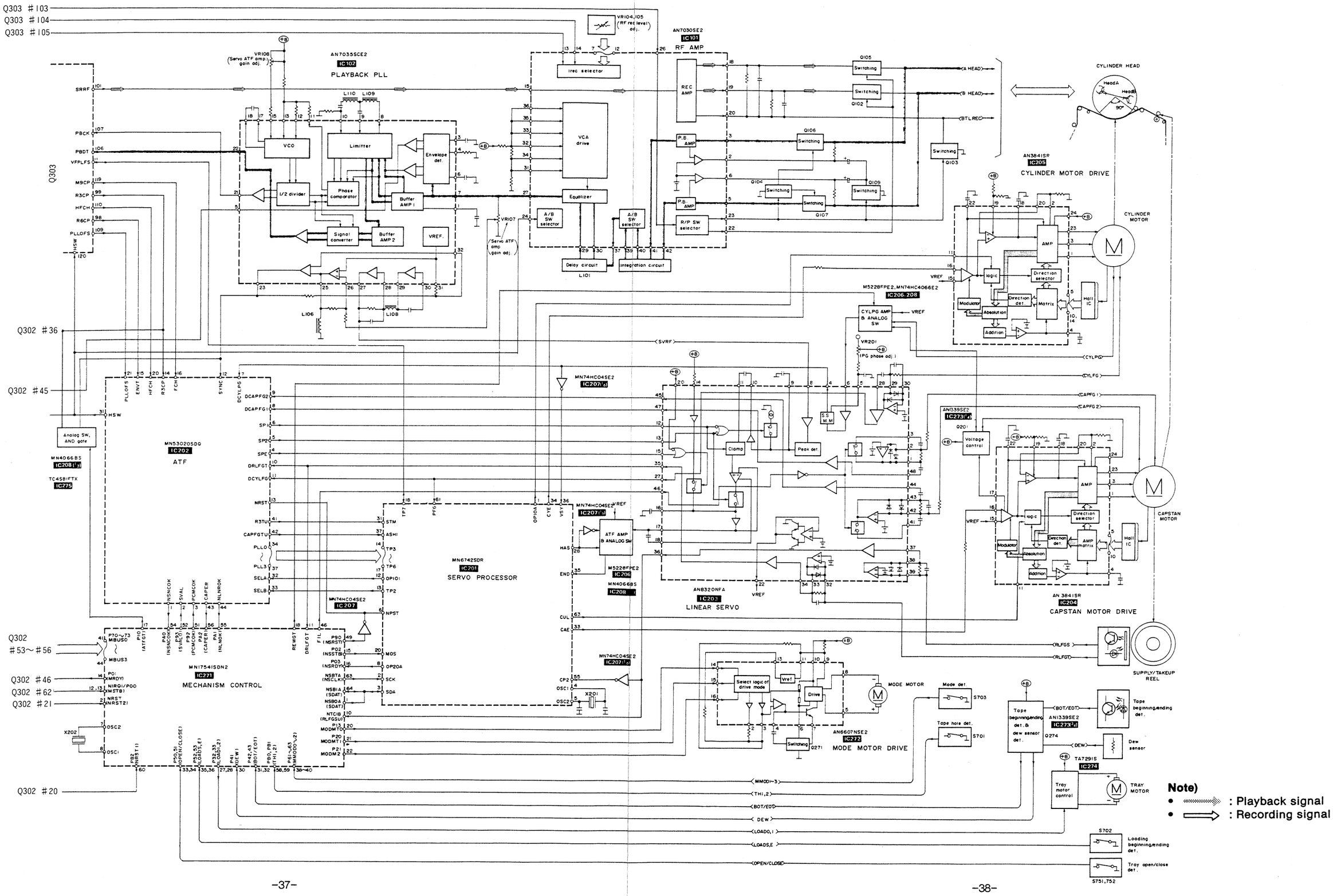


Fig. 1

BLOCK DIAGRAM

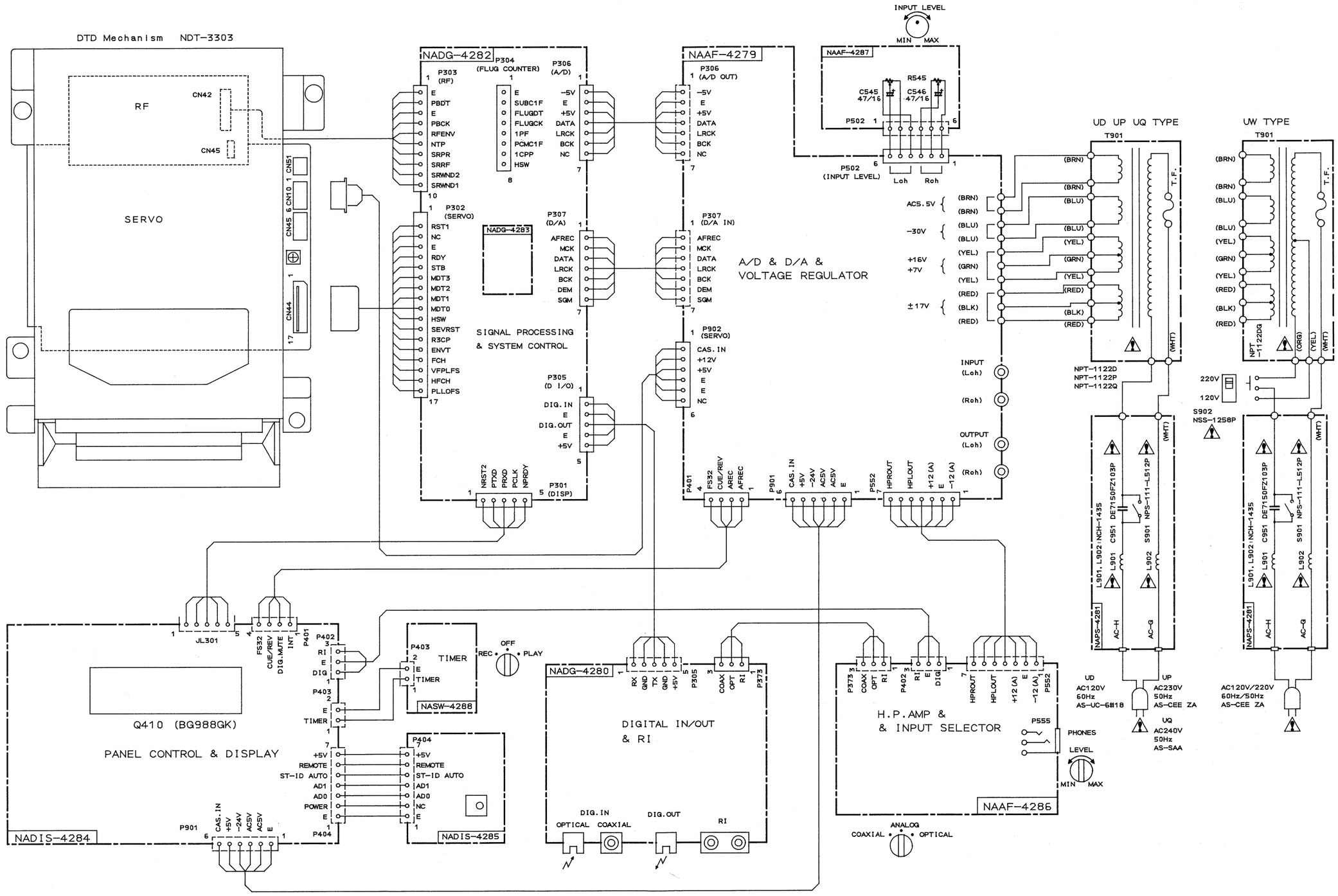


MECHANISM SECTION

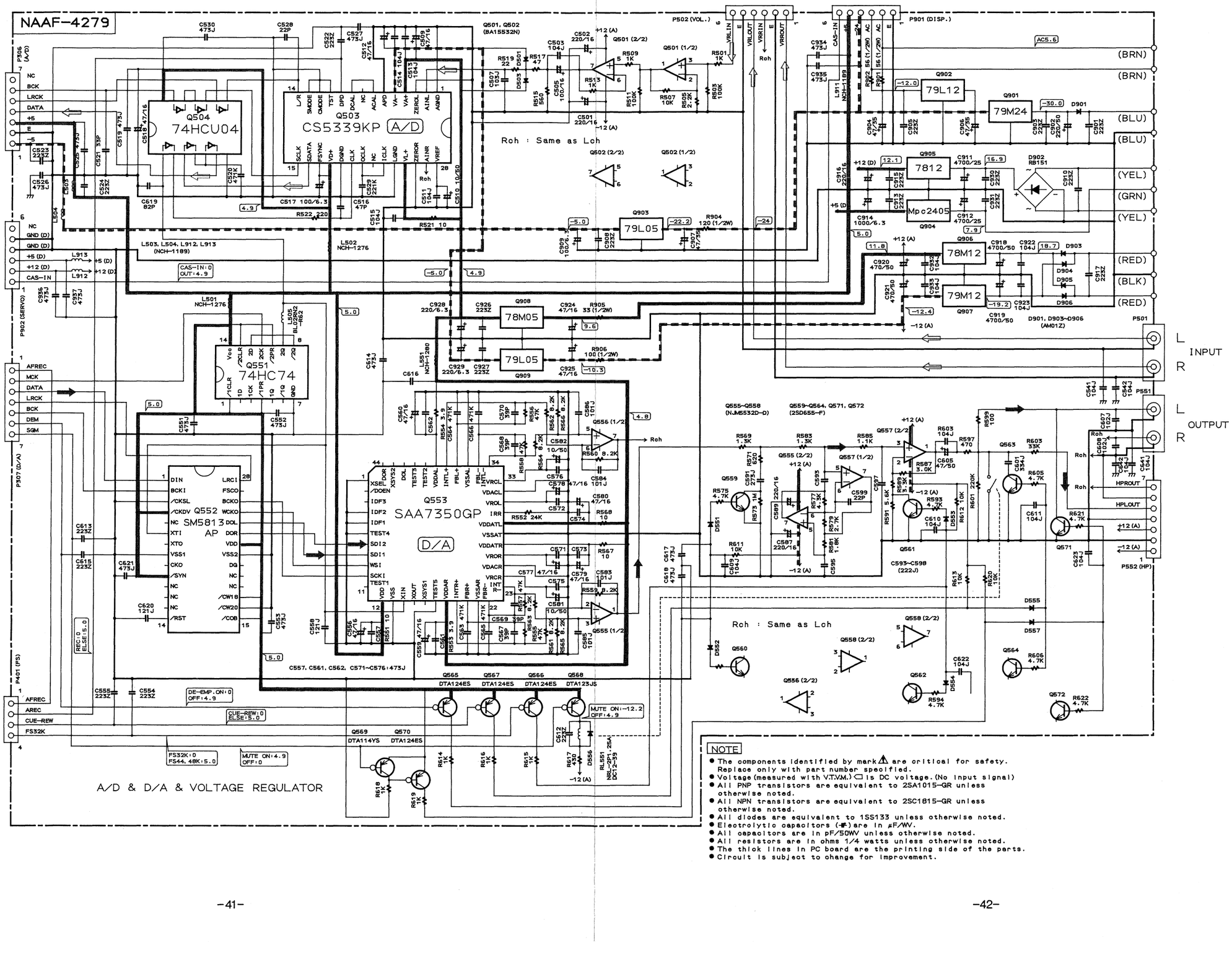


SCHEMATIC DIAGRAM

CONNECTION DIAGRAM



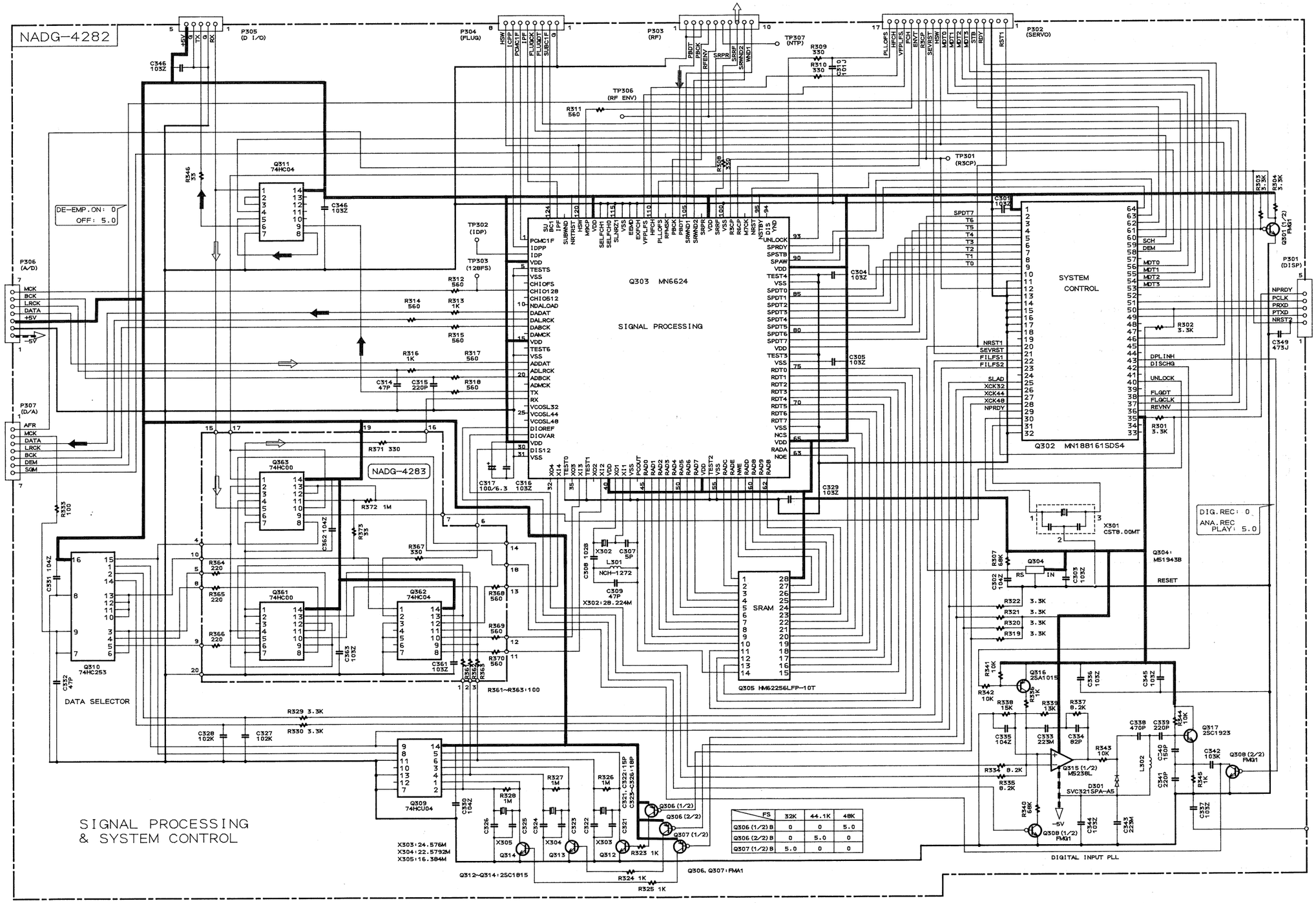
AUDIO SECTION



NOTE

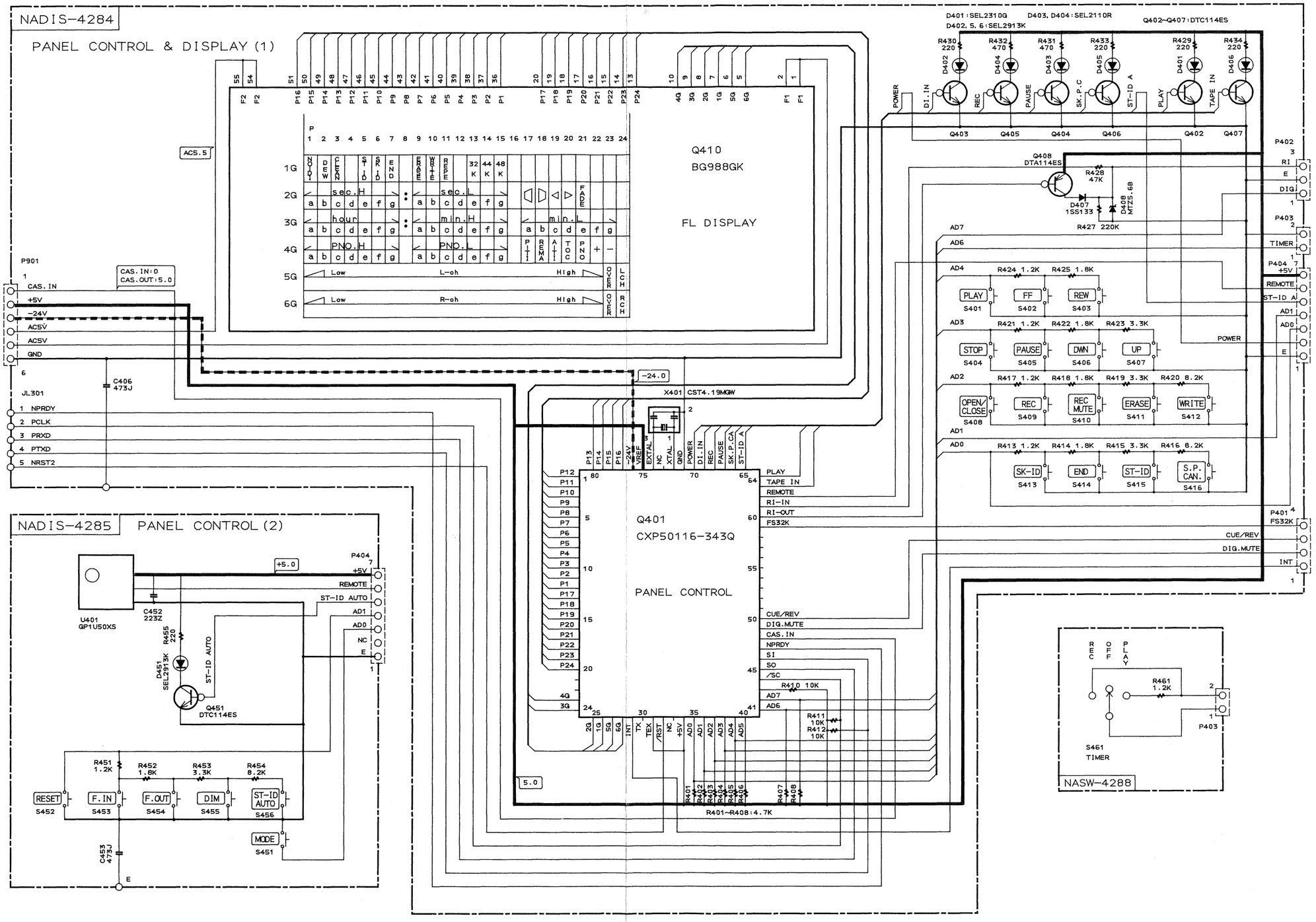
- The components identified by mark ⚠ are critical for safety. Replace only with part number specified.
- Voltage (measured with V.T.V.M.) ⊐ is DC voltage. (No input signal)
- All PNP transistors are equivalent to 2SA1015-GR unless otherwise noted.
- All NPN transistors are equivalent to 2SC1815-GR unless otherwise noted.
- All diodes are equivalent to 1SS133 unless otherwise noted.
- Electrolytic capacitors (#) are in μF/WV.
- All capacitors are in pF/50WV unless otherwise noted.
- All resistors are in ohms 1/4 watts unless otherwise noted.
- The thick lines in PC board are the printing side of the parts.
- Circuit is subject to change for improvement.

DIGITAL SECTION

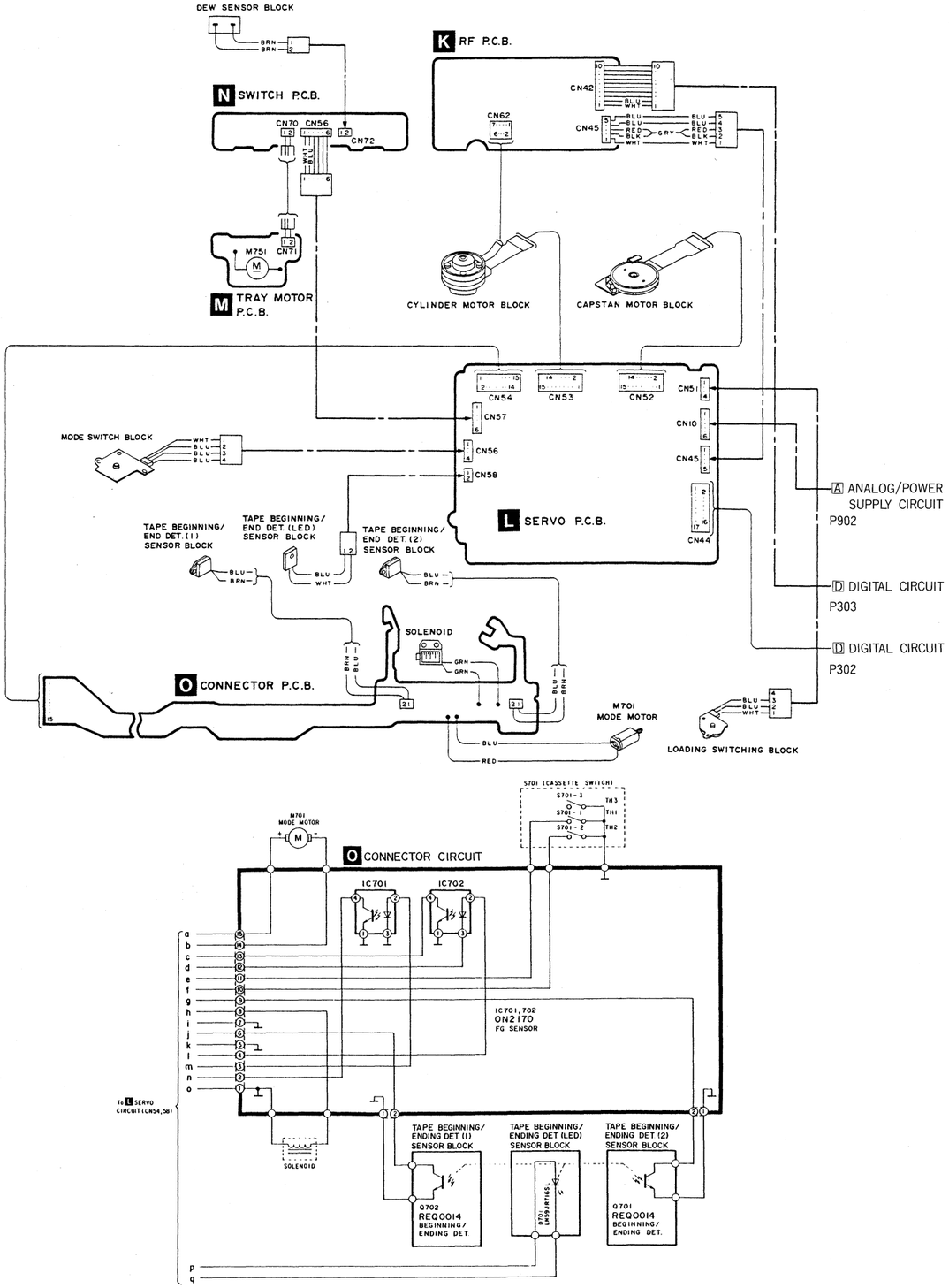


FS	32K	44.1K	48K
Q306 (1/2) B	0	0	5.0
Q306 (2/2) B	0	5.0	0
Q307 (1/2) B	5.0	0	0

CONTROL SECTION



WIRING CONNECTION DIAGRAM
MECHANISM SECTION



1 2 3 4

A

B

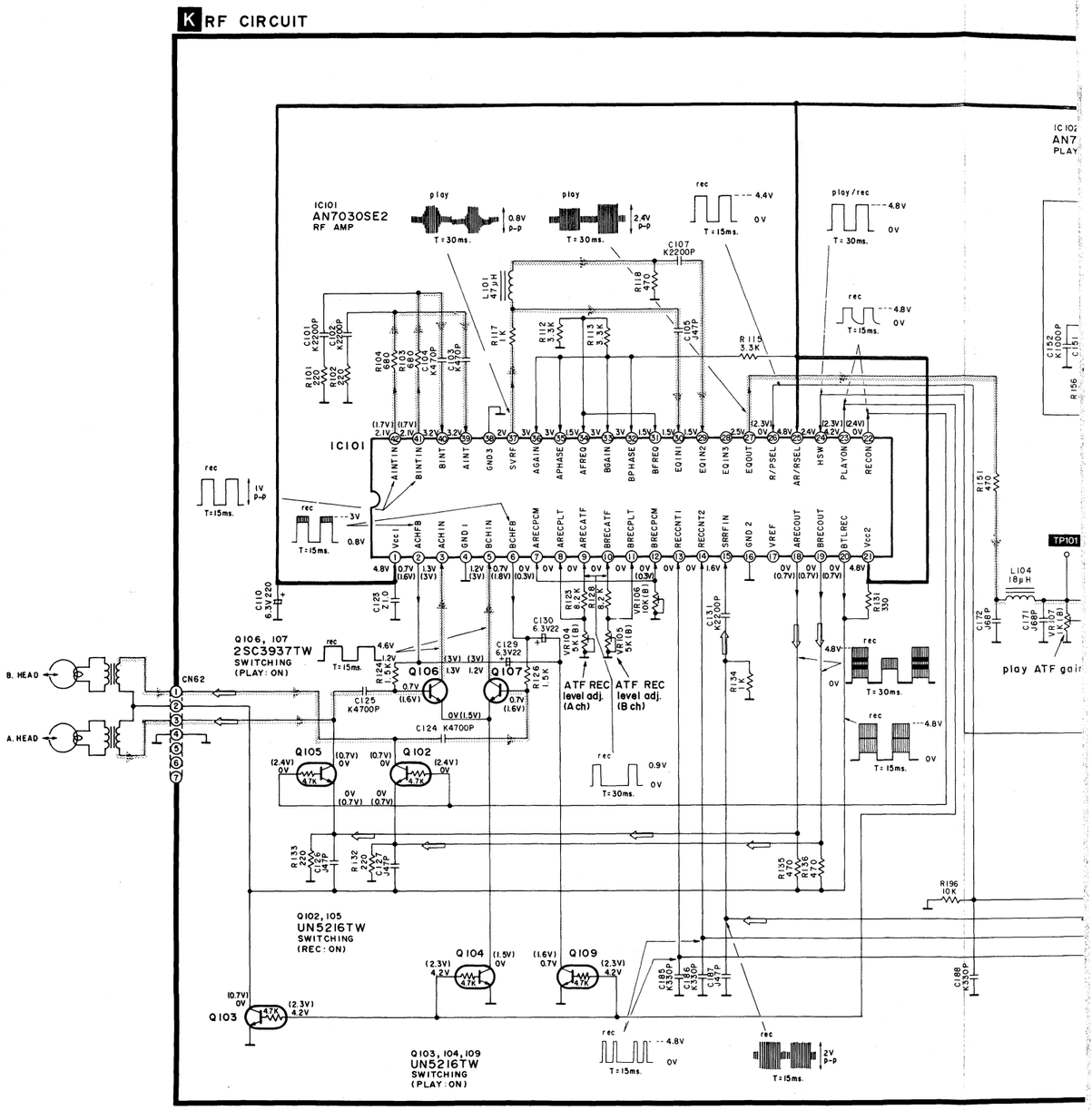
C

D

E

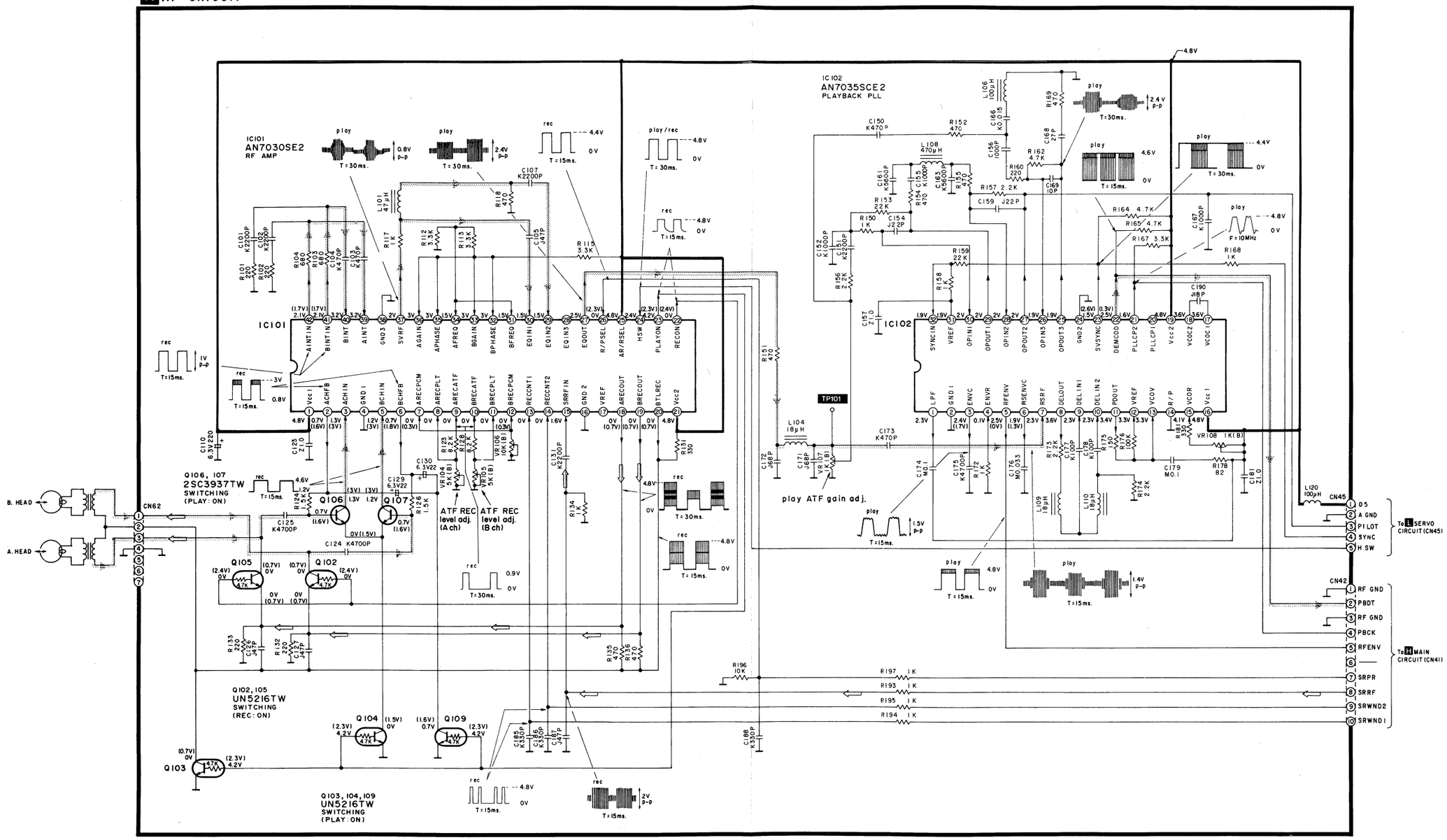
F

RF SECTION



RF SECTION

K RF CIRCUIT

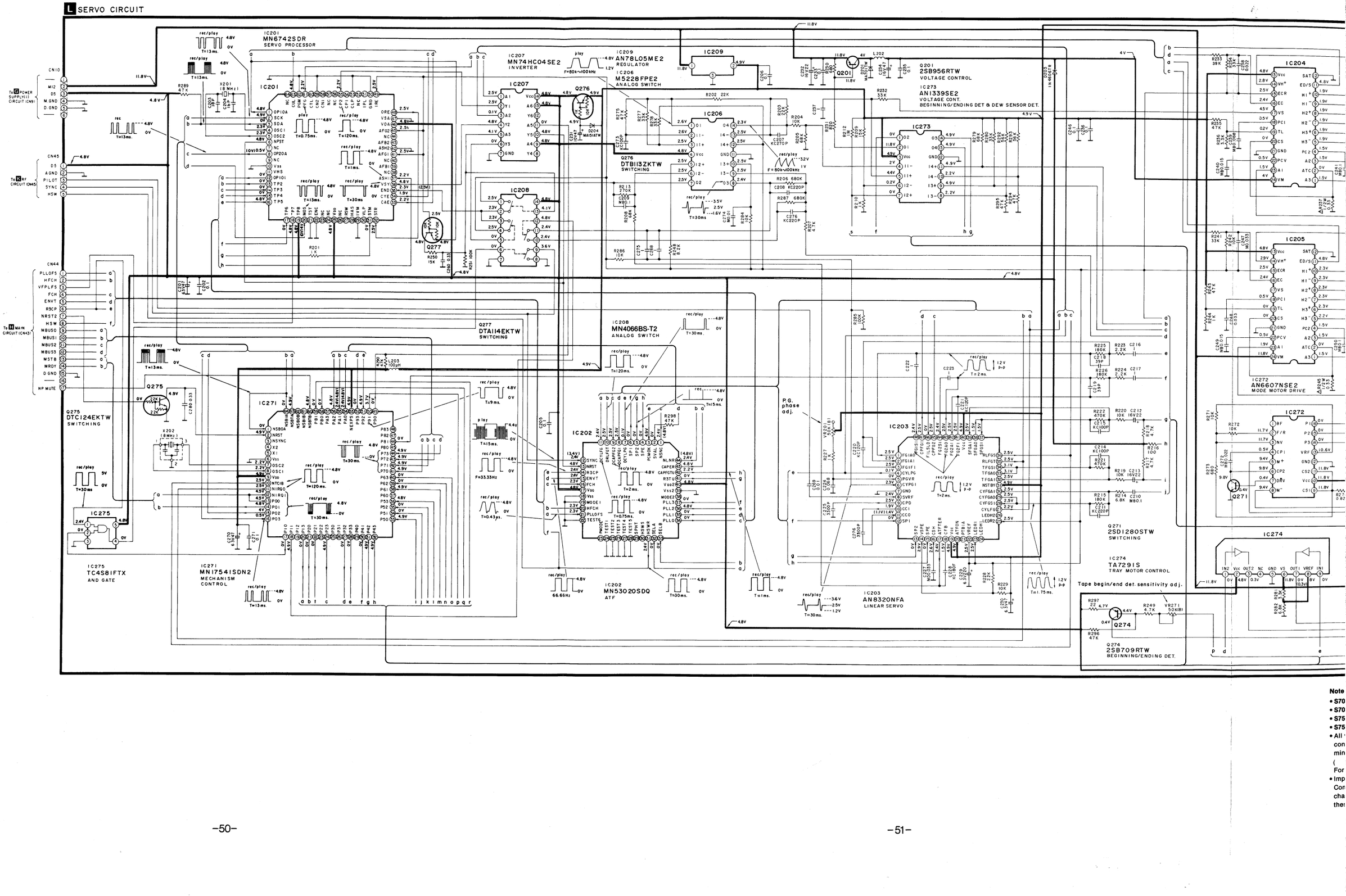


Note

- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise specified.
  ( ).....Voltage values at recording mode.
  For measurement us EVM.
- Important safety notice
  Components identified by △ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.
- (———) indicates +B (bias).
- (- - -) indicates −B (bias).
- (⟿) indicates the flow of the playback signal.
- (⇨) indicates the flow of the recording signal.

SERVO SECTION

L SERVO CIRCUIT


IC201 MN6742SDR SERVO PROCESSOR
IC207 MN74HC04SE2 INVERTER
IC209 AN78L05ME2 REGULATOR
IC206 M5228FPE2 ANALOG SWITCH
Q276 DTBII3ZKTW SWITCHING
Q277 DTAII4EKTW SWITCHING
IC208 MN4066BS-T2 ANALOG SWITCH
Q201 2SB956RTW VOLTAGE CONTROL
IC273 AN1339SE2 VOLTAGE CONT. BEGINNING/ENDING DET & DEW SENSOR DET.
IC204
IC205
IC272 AN6607NSE2 MODE MOTOR DRIVE
IC271 MN1754ISDN2 MECHANISM CONTROL
IC275 TC4S81IFTX AND GATE
Q275 DTC124EKTW SWITCHING
IC202 MN53020SDQ ATF
IC203 AN8320NFA LINEAR SERVO
Q271 2SD1280STW SWITCHING
IC274 TA7291S TRAY MOTOR CONTROL
Q274 2SB709RTW BEGINNING/ENDING DET.
P.G. phase adj.
Tape begin/end det. sensitivity adj.
To G POWER SUPPLY(1) CIRCUIT (CN51)
To K RF CIRCUIT (CN45)
To H MAIN CIRCUIT (CN43)

Note

- S70
- S70
- S75
- S75
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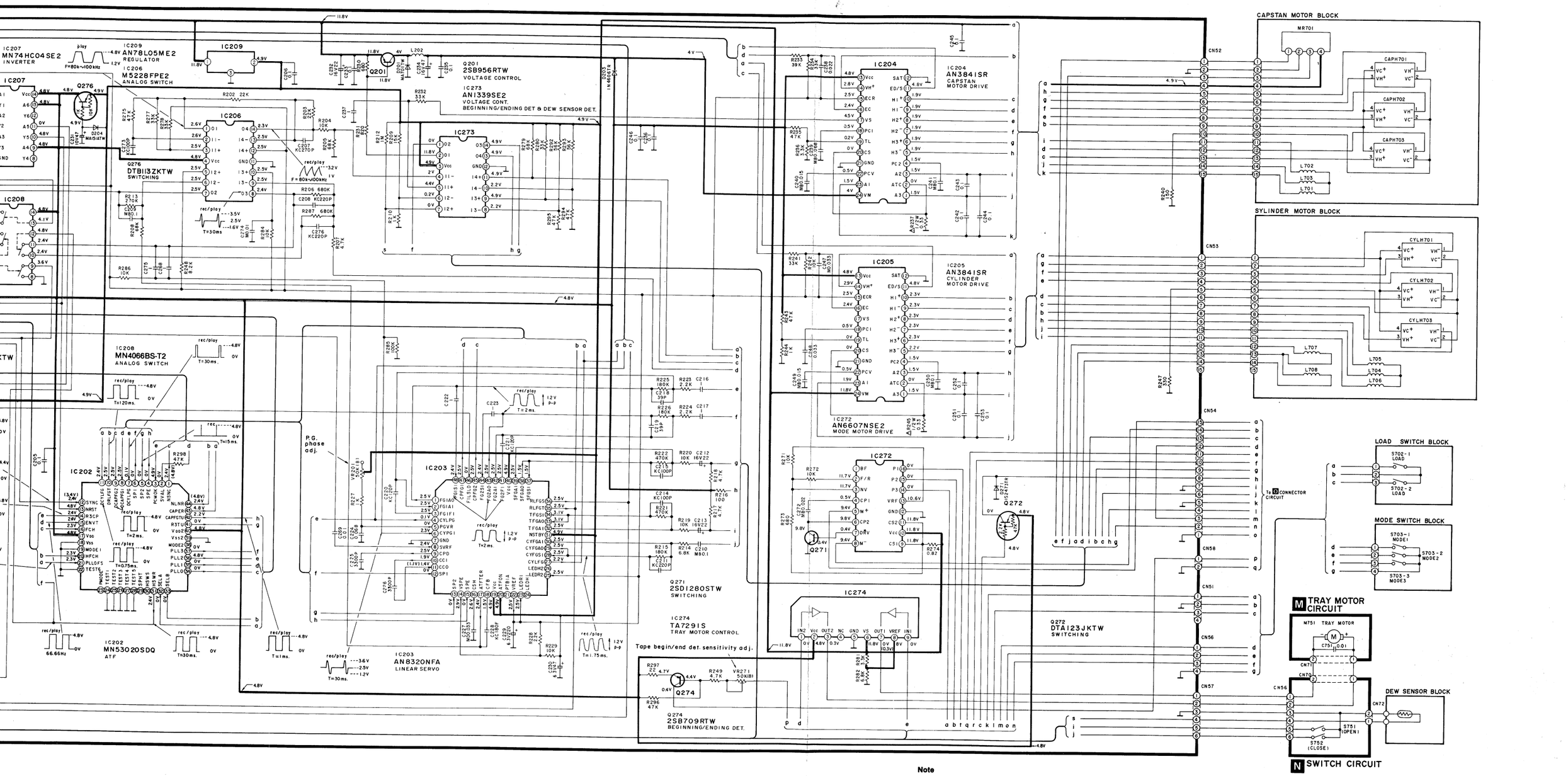
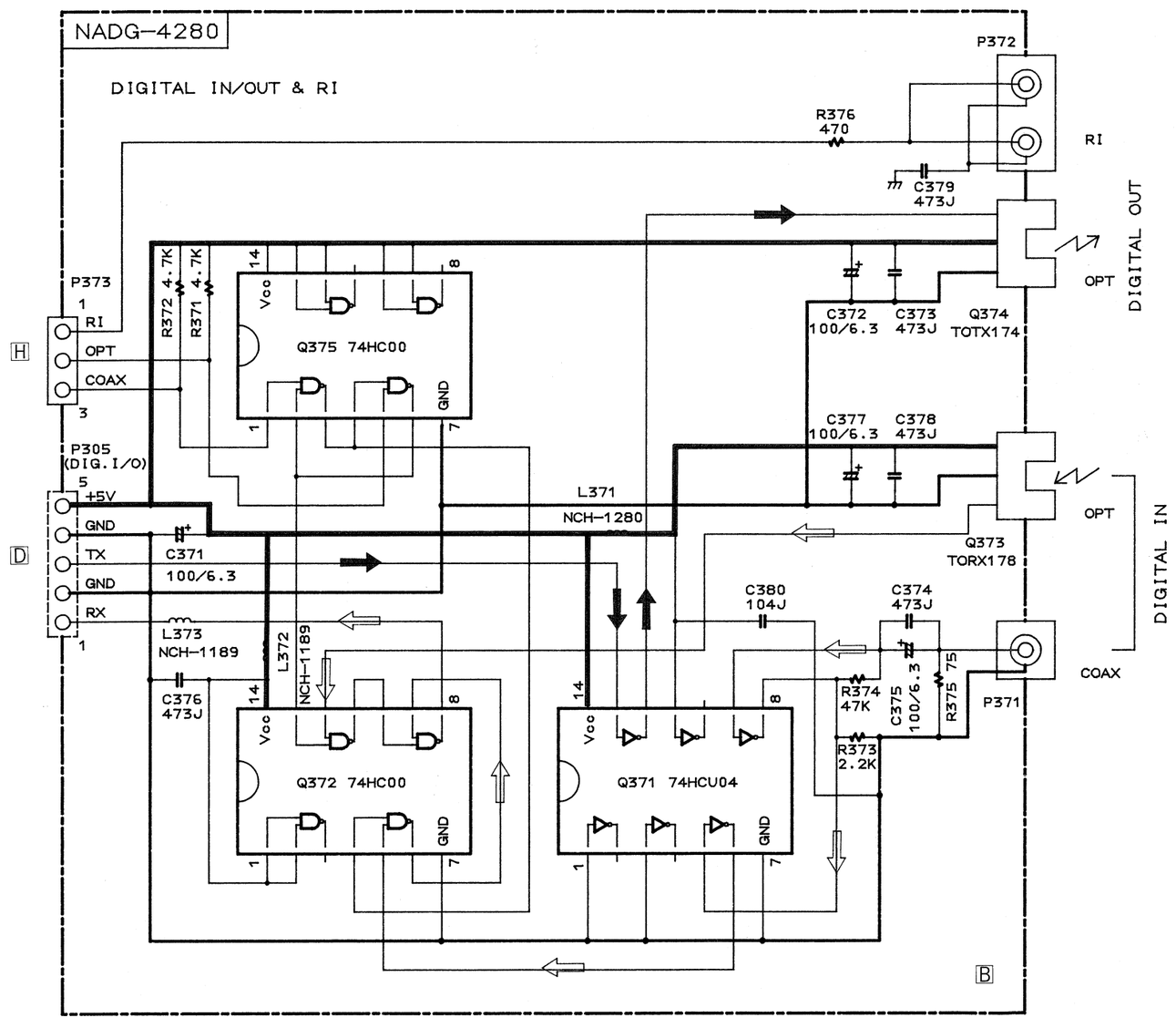


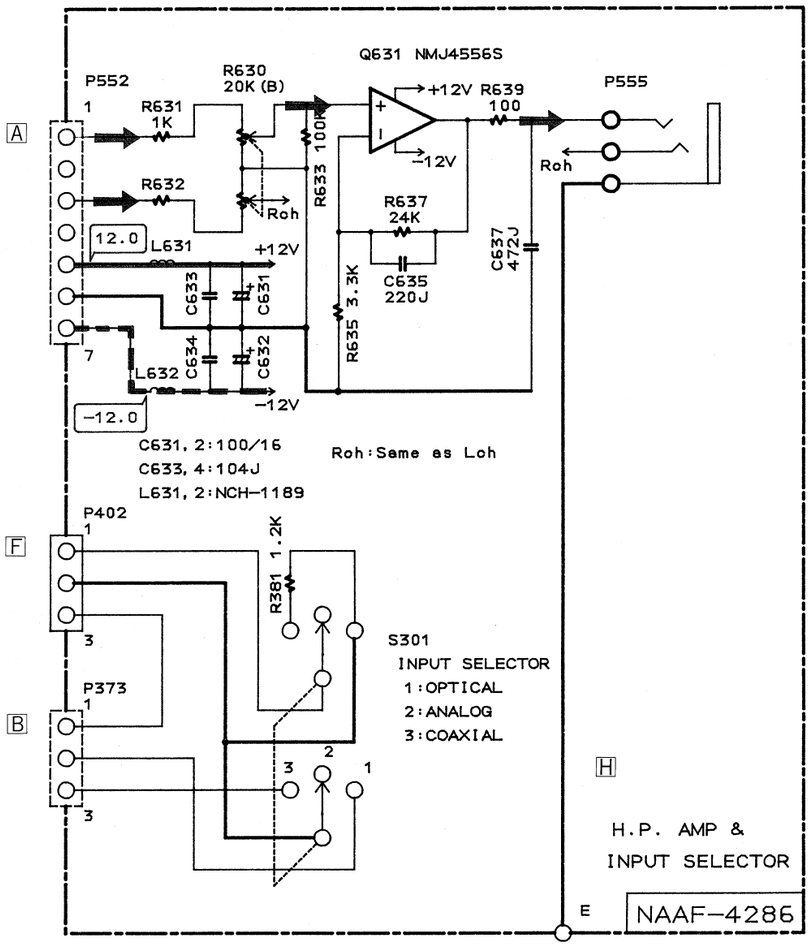
Note

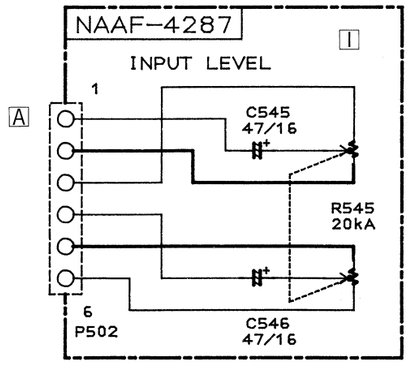
- **S702** : Loading detection switch.
- **S703** : Mode detection switch.
- **S751** : Cassette tray open detection switch.
- **S752** : Cassette tray close detection switch.
- All voltage values shown in circuitry are under no signal condition and playback mode with volume control at minimum position otherwise specified.
  ( ).....Voltage values at recording mode.
  For measurement us EVM.
- Important safety notice
  Components identified by ⚠ mark have special characteristics important for safety. When replacing any of these components, use only manufacturer's specified parts.

- (———) indicates +B (bias).
- (- - - -) indicates −B (bias).
- (⟿) indicates the flow of the playback signal.
- (⟹) indicates the flow of the recording signal.
- The "IC701, IC702, Q701, Q702, D701, MR701, L701~708, CAPH701~703, CYLH701~703" parts are not supplied separately and are thus not found on the replacement parts list.

INPUT/OUTPUT SECTION







: PLAYBACK SIGNAL

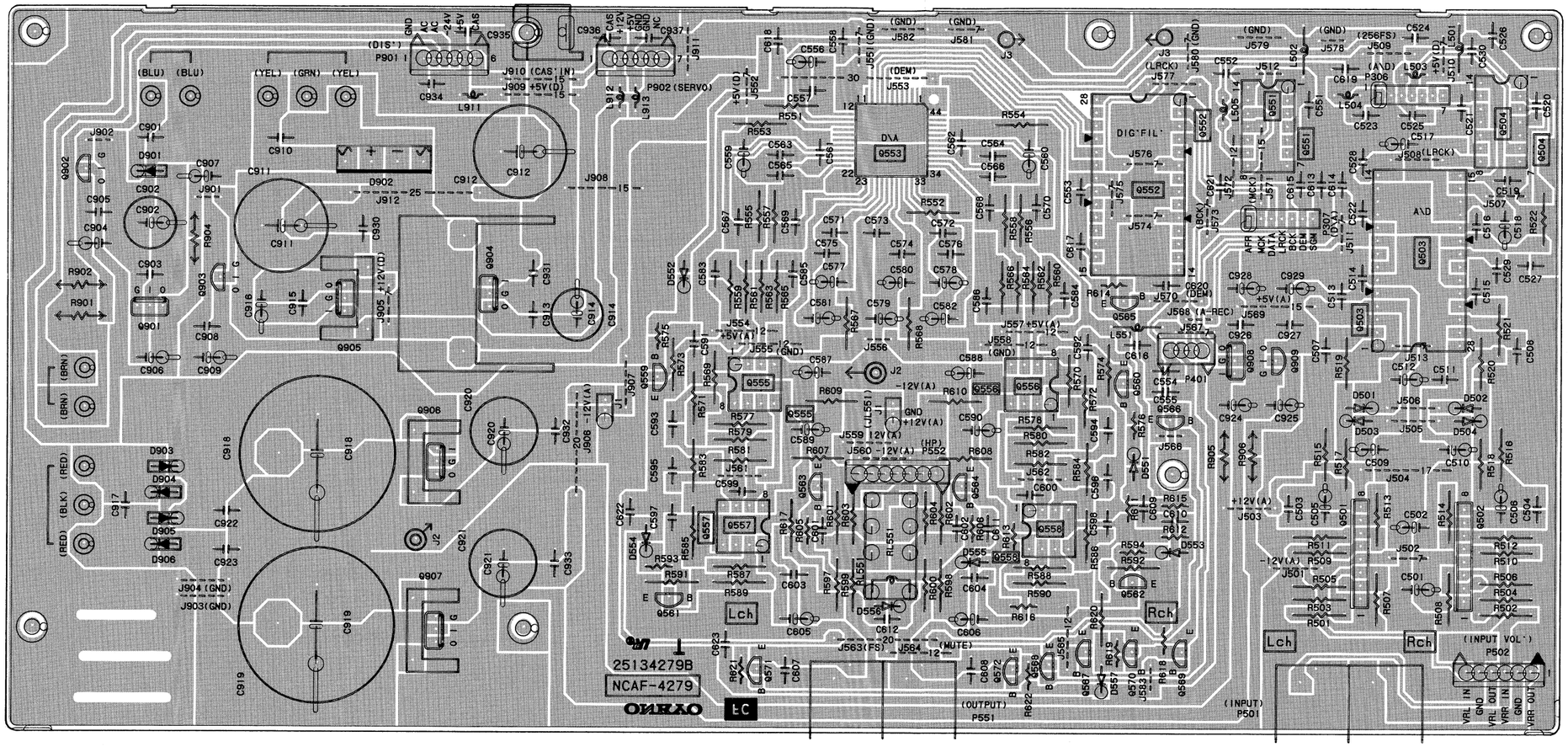
: RECORDING SIGNAL

: +B

: −B

ONKYO CORPORATION

PRINTED CIRCUIT BOARD VIEW FROM BOTTOM SIDE


25134279B
NCAF-4279
ONKYO
(DIS')
P901
P902(SERVO)
J910(CAS'IN)
J909 +5V(D)
J908
J905 +12V(D)
J907
J904(GND)
J903(GND)
J902
J901
J912
J911
(BLU) (BLU)
(YEL) (GRN) (YEL)
(BRN) (BRN)
(RED) (BLK) (RED)
D901
D902
D903
D904
D905
D906
Q901
Q902
Q903
Q904
Q905
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Q907
Q908
R901
R902
R903
R904
C901
C902
C903
C904
C905
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C908
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C920
C921
C922
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C930
C931
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C936
C937
L911
(GND)
(DEM)
J553
D\A
Q553
J582
J581
J3
J577
J576
J575
J574
DIG'FIL'
Q552
Q551
J579
J578
(256FS)
(AND)
L502
L503
L504
P306
J508
J507
A\D
Q503
Q504
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J558
J559 12V(A)
J560 -12V(A)
J561
J562
J563(FS)
J564
(MUTE)
J565
J566
J567
J568 (A-REC)
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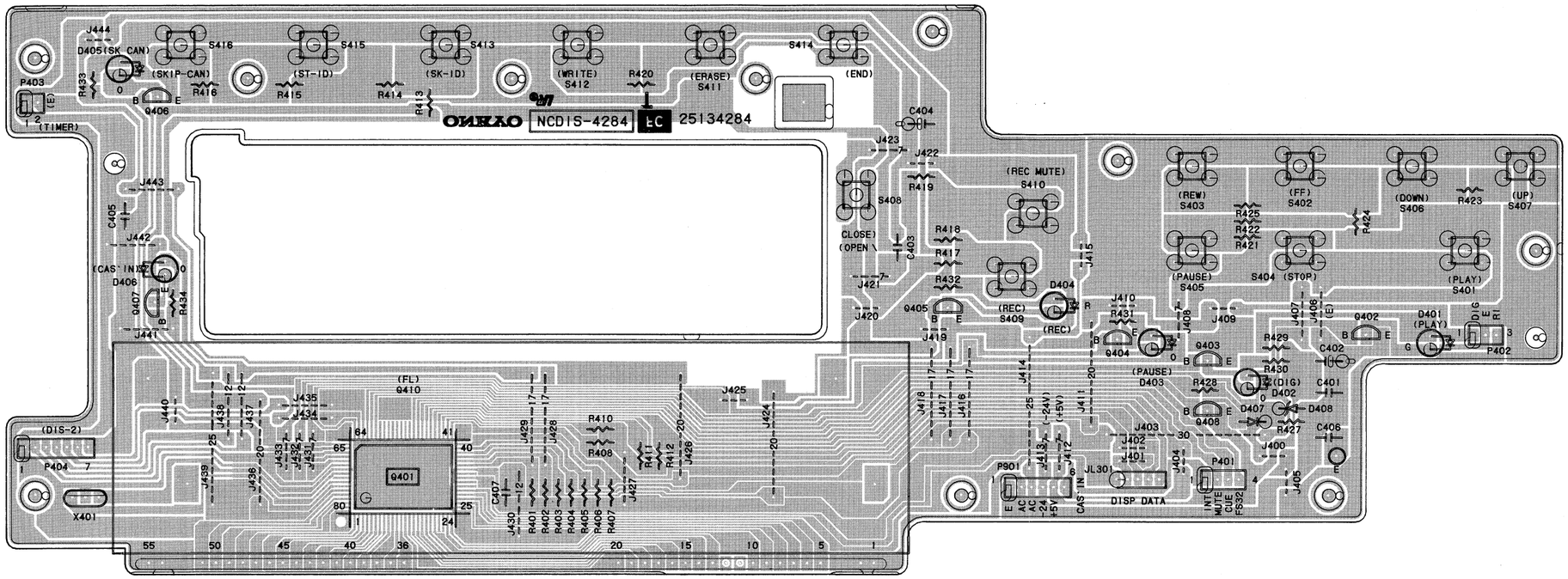
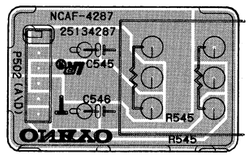
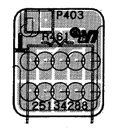


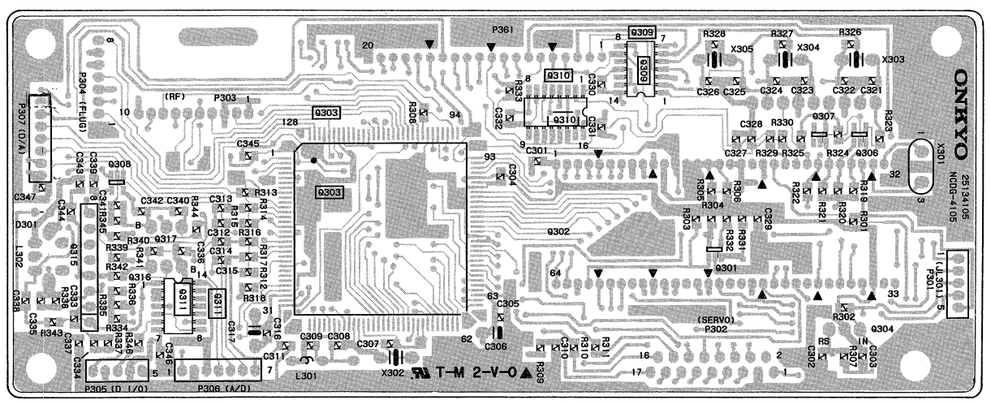
INPUT LEVEL
VOLUME PC BOARD

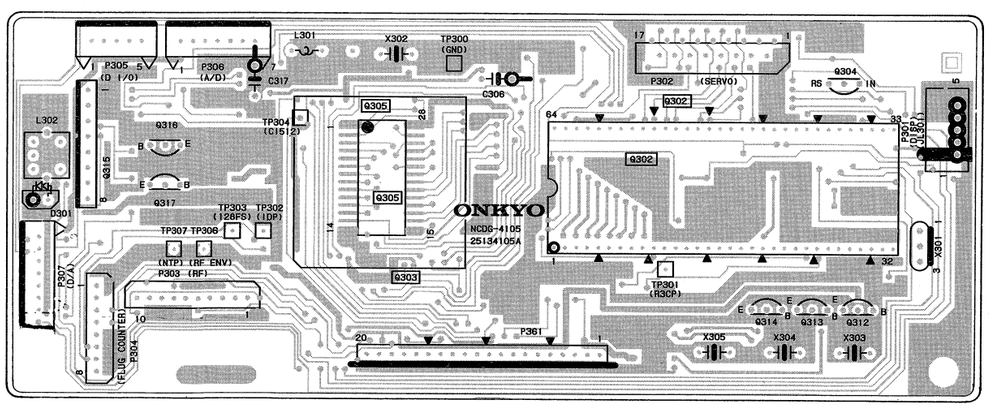




TIMER SWITCH
PC BOARD

DISPLAY CIRCUIT PC BOARD





DIGITAL CIRCUIT PC BOARD

PRINTED CIRCUIT BOARD PARTS LIST

ANALOGUE AND POWER SUPPLY CIRCUIT PC BOARD(NAAF-4279-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q501,Q502	22240335	BA15532N
Q503	22240524	CS5339-KP
Q504	222755	74HCU04
Q551	222740745	74HC74
Q552	22240288	SM5813AP
Q553	22240523R3	SAA7350GP
Q555-Q558	222902	NJM5532D-D
Q901	222790245MIT	79M24L
Q902	222790123	79L12
Q903	222790053	79L05
Q904	22240426	μPC2405HF
Q905	222780120	7812
Q906	222780125MIT	78M12L
Q907	222790125MIT	79M12
Q908	222780055MIT	78M05
Q909	222790053	79L05
	Transistors	
Q559-Q564	2211705 or	2SD655-E or
Q571,Q572	2211706	2SD655-F
Q565-Q567	2212600	DTA124ES
Q568	2213710	DTA123JS
Q569	2213090	DTA114YS
Q570	2212600	DTA124ES
	Diodes	
D501-D504	223205 or	1SS270A or
D551-D557	223163	1SS133
D901	22380046	AM01Z
D902	22380043	RB151
D903-D906	22380046	AM01Z
	Coils	
L501,L502	233409K047	NCH-1276
L503,L504	230911 or	LFW7A-M3R2A0 or
L911-L913	233376	NCH-1189
L551	233409K100	NCH-1280
	Core	
L505	230906	BL02RN2-R62
	Capacitors	
C501,C502	393142217	220μF,16V,Elect.
C503,C504	374721044	0.1μF±5%,50V,Plastic
C505,C506	393041017	100μF,16V,Elect.
C507,C508	374721034	0.01μF±5%,50V,Plastic
C509	393144707	47μF,16V,Elect.
C510	393181007	10μF,50V,Elect.
C511	374721044	0.1μF±5%,50V,Plastic
C512	393144707	47μF,16V,Elect.
C513-C515	374721044	0.1μF±5%,50V,Plastic
C517	354721019	100μF,6.3V,Elect.
C518	393144707	47μF,16V,Elect.
C541,C542	375521044	0.1μF±5%,50V,Plastic
C556	393144707	47μF,16V,Elect.
C559,C560	393144707	47μF,16V,Elect.
C577-C580	393144707	47μF,16V,Elect.
C581,C582	393181007	10μF,50V,Elect.
C583-C586	373301014	100pF±5%,125V,Plastic
C587-C590	393142217	220μF,16V,Elect.
C591,C592	374722734	0.027μF±5%,50V,Plastic
C593-C598	373632224	2200pF±5%,100V,Plastic
C601,C602	374723344	0.33μF±5%,50V,Plastic
C603,C604	374721044	0.1μF±5%,50V,Plastic
C605,C606	391251017	100μF,25V,Elect.
C607,C608	374721024	1000pF±5%,50V,Plastic
C609-C611	374721044	0.1μF±5%,50V,Plastic
C622,C623	374721044	0.1μF±5%,50V,Plastic
C641,C642	375521044	0.1μF±5%,50V,Plastic
C902	354782219	220μF,50V,Elect.
C904,C906	354764709	47μF,35V,Elect.
C907	354764709	47μF,35V,Elect.
C909	354721019	100μF,6.3V,Elect.
C911,C912	354754729	4700μF,25V,Elect.
C914	354721029	1000μF,6.3V,Elect.
C916	393142217	220μF,16V,Elect.
C918,C919	3504250A	4700μF,50V,Elect.
C920,C921	391984717	470μF,50V,Elect.
C922,C923	373791044	0.1μF±5%,63V,Plastic
C924,C925	393144707	47μF,16V,Elect.
C928,C929	393122217	220μF,6.3V,Elect.
C932,C933	374721044	0.1μF±5%,50V,Plastic
	Resistors	
R901,R902	442525604	56ohm,1/2W,Metal oxide film
R904	442521214	120ohm,1/2W,Metal oxide film
R905	442523304	33ohm,1/2W,Metal oxide film
R906	442521014	100ohm,1/2W,Metal oxide film
	Relay	
RL551	25065282	NRL-2P1.25ADC12-39
	Terminals	
P501	25045352	NPJ-2PDBL198,INPUT
P551	25045352	NPJ-2PDBL198,OUTPUT
	Sockets	
P306	2002291410	NSAS-14P0269
P307	2002221410	NSAS-14P0270
	Plugs	
P401	25055148	NPLG-4P132
P502	25055136	NPLG-6P120
P552	25055137	NPLG-7P121
P901	25055150	NPLG-6P134
P902	25055525	NPLG-6P501
	Cables	
	2065525140	With terminal
JL551	76637	UL2651#243-2.0
	Radiators	
	27160220	RAD-51(B)
	27160221	RAD-74(B)

DIGITAL IN/OUT TERMINAL PC BOARD(NADG-4280-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q371	222755	74HCU04
Q372,Q375	222740005	74HC00
	Photo couplers	
Q373	24120034	TORX178
Q374	24120031	TOTX178
	Coils	
L371	233409K100	NCH-1280
L372,L373	230911 or	LFW7A-M3R2A0 or
	233376	NCH-1189
	Capacitors	
C371,C372	354721019	100μF,6.3V,Elect.
C375,C377	354721019	100μF,6.3V,Elect.
	Socket	
P305	2002291025	NSAS-10P0268

CIRCUIT NO.	PART NO.	DESCRIPTION
	Terminals	
P371	25045248	NPJ-1PDOR120,Digital IN
P372	25045330	NPJ-2PDBL184,RI
	Plug	
P373	25055147	NPLG-3P131

POWER SWITCH PC BOARD(NAPS-4281-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
L901,L902	231208	⚠ NCH-1435,Coils
C951	3500065A	⚠ DE7150FZ103PAC400V/125V, IS capacitor
S901	25035550	⚠ NPS-111-L512P,Power switch
	27301216	⚠ Cover for C951

DIGITAL CIRCUIT PC BOARD(NADG-4282-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q302	22240416	MN188161SDS4
Q303	22240423R3	MN6624
Q304	222951	M51943B
Q305	22240417R9	HM62256LFP-10T
Q309	222740046R1	74HCU04
Q310	222742535R9	74HC253
Q311	222740045R1	74HC04
Q315	222966	M5238L
	Transistors	
Q301,Q308	2213930R2	FMG1
Q306,Q307	2213920R2	FMA1
Q312-Q314	2211254 or	2SC1815-Y or
	2211255	2SC1815-GR
Q316	2211454 or	2SA1015-Y or
	2211455	2SA1015-GR
Q317	2211722 or	2SC1923-R or
	2211723	2SC1923-O
	Diode	
D301	223198	SVC321SPA-A5
	Coils	
L301	233409M022 or	NCH-1272 or
	233400M022	NCH-2226
L302	231190	NSO-4054
	Ceramic oscillator	
X301	3010154	CST8.00MT
	Crystals	
X302	3010177	AF3781CH
X303	3010176	AF3817CF
X304	3010175	AF6630CE
X305	3010174	AF5115CF
	Sockets	
P301	25050527	NSCT-5P350
P302	25050500	NSCT-17P323
	Plugs	
P303	25055529	NPLG-10P505
P304	25055527	NPLG-8P503
P305	25055149	NPLG-5P133
P306,P307	25055151	NPLG-7P135
	Holder	
	27190862	

GATE CIRCUIT PC BOARD(NADG-4283-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
Q361,Q363	222740005R1	74HC00
Q362	222740045R1	74HC04
	Plug	
P361	25055564	NPLG-20P538

DISPLAY CIRCUIT PC BOARD(NADIS-4284-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	IC	
Q401	22240526	CXP50112-343Q
	Transistors	
Q402-Q407	2213290	DTC114ES
Q408	2213510	DTA114ES
	FL tube	
Q410	212103	BG-988GK
	L.E.Ds	
D401	225205C or	SEL-2310G-C or
	225205D	SEL-2310G-D
D402	225142	SEL2913K
D403,D404	225237C or	SEL2110R-C or
	225237D	SEL2110R-D
D405,D406	225142	SEL2913K
	Diodes	
D407	223205 or	1SS270A or
	223163	1SS133
D408	224450562	MTZ5.6B
	Ceramic oscillator	
X401	3010163	CST4.19MGW
	Capacitors	
C402,C404	354721019	100μF,6.3V,Elect.
	Switches	
S401-S416	25035548	NPS-111-S510
	Cables	
JL301,JL401	76637	UL2651#26
	2061713100	With terminal
	Sockets	
P401	2006390840	NSAS-8P0284
P403	2006390410	NSAS-4P0275
P404	2006391405	NSAS-14P0272
P901	2006391245	NSAS-12P0283
	Brackets	
	27141447	FL
	Spacers	
	27270341	L.E.D

REMOTE CONTROL SENSOR PC BOARD(NADIS-4285-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
U401	24130003	GP1U50XS,IC
Q451	2213290	DTC114ES,Transistor
D451	225142	SEL2913K,L.E.D
S451-S456	25035548	NPS-111-S510,Switches
	27270341	Spacer
	2061713100	Cable with terminal

MECHANISM SECTION

CIRCUIT NO.	PART NO.	DESCRIPTION
	ICs	
IC101	22240451R0	AN7030S
IC102	22240452R0	AN7035SC
IC201	22240441R0	MN6742SDR
IC202	22240442R0	MN53020SDQ
IC203	22240443R0	AN8320NFA
IC204,IC205	22240444	AN3841SR
IC206	22240450	M5228FP
IC207	222740045R0MA	74HC04
IC208	22240445R0MA	MN74HC4066
IC209	222780053R0MA	78L05
IC271	22240446R0	MN17541SDN
IC272	22240447R0	AN6607NS
IC273	22240448R0	AN1339S
IC274	22240239	TA7291S
IC275	22240449R0	TC4S81FTX
	Transistors	
Q102-Q105	2214000R0	UN5216
Q106,Q107	2214010R0	2SC3937
Q109	2214000R0	UN5216
Q201	2214024R0	2SB956-R
Q271	22140350R0	2SD1280-S
Q272	2214090R1	DTA123JK
Q274	2214044R0	2SB709-R
Q275	2214070R1	DTC124EK
	Diodes	
D201	223199R0	MA701
D203	223200	1N4606
D271	223124	1S2473
	Coils	
L101	231194R1	ELJFA470KF
L104	231193R1	ELJFA180KF
L106	231195R1	ELJFA101KF
L108	231197	RLQZB471KTD
L109,L110	231193R1	ELJFA180KF
L120,L203	231196	RLQZB101KT-D
L202	231199	RLM9R001-Z
	Crystal	
X201	3010178	C8M00J01
	Ceramic oscillator	
X202,X301	3010154	CST8.00MT
X601	3010149	CST6.00MGW
	Elect. capacitors	
C110	355722219	220 μ F,6.3V
C129,C130	355722209	22 μ F,6.3V
C201,C230	355724709	47 μ F,6.3V
C212,C213	355742209	22 μ F,16V
C229	355722219	220 μ F,6.3V
C232	355742209	22 μ F,16V
C234	355744709	47 μ F,16V
C270	355724709	47 μ F,6.3V
	Plastic capacitor	
C224	375526834	0.068 μ F±5%,50V

CIRCUIT NO.	PART NO.	DESCRIPTION
	Metal oxide film resistors	
R237,R245	441520334	3.3 ohm,1/2W
R274	441528294	0.82 ohm,1/2W
	Semi-fixed resistors	
VR104,VR105	5225118	EVNDXAA00B53
VR106	5225117	EVNDXAA00B14
VR107,VR108	5225116	EVNDXAA00B13
VR201	5225119	EVNDXAA00B54
VR271	5221026	EVNDCAA03B54
	Plugs	
CN10	25055525	NPLG-6P500
CN45	25055524	NPLG-5P499
CN51	25055522	NPLG-3P497
CN56	25055575	RJP4G28ZA
CN57	25055576	RJP6G28ZA
CN58	25055577	RJT036W002
	Sockets	
CN44	25050500	NSCT-17P323
CN52-CN54	25050358	NSCT-15P185
CN62	25050354	NSCT-11P181
JCN42	2009990152	REZ0125A
JCN45	2009990164	REZ0126A

HEADPHONE AMPLIFIER PC BOARD(NAAF-4286-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
	IC	
Q631	222887	NJM4556S
	Coils	
L631,L632	230911 or 233376	LFW7A-M3R2A0 or NCH-1189
	Capacitors	
C631,C633	393141017	100 μ F,16V,Elect.
C632,C634	374721044	0.1 μ F±5%,50V,Plastic
C637,C638	374724724	4700pF±5%,50V,Plastic
	Resistors	
R630	5104295	N09GL20KB15F,Variable, Headphone
R639,R640	442521014	100ohm,1/2W,Metal oxide film
	Switch	
S301	25030352	NRSF-123-15SBM
	Sockets	
P373	2002290630	NSAS-6P0267
P552	2009990195	NSAS-14P0264
	Terminal	
P553	25045221	HLJ0540-01-410

INPUT LEVEL VOLUME PC BOARD(NAAF-4287-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
C545,C546	393044707	47 μ F,16V,Elect. capacitors
R545	5104281	N18RKL20KA25F,Variable resistor
P502	2009990197	NSAS-12P0266,Socket

TIMER SWITCH PC BOARD(NASW-4288-1)

CIRCUIT NO.	PART NO.	DESCRIPTION
S401	25030352	NRSF-123-15SBM,Rotary switch

NOTE:
THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.

PARTS LIST

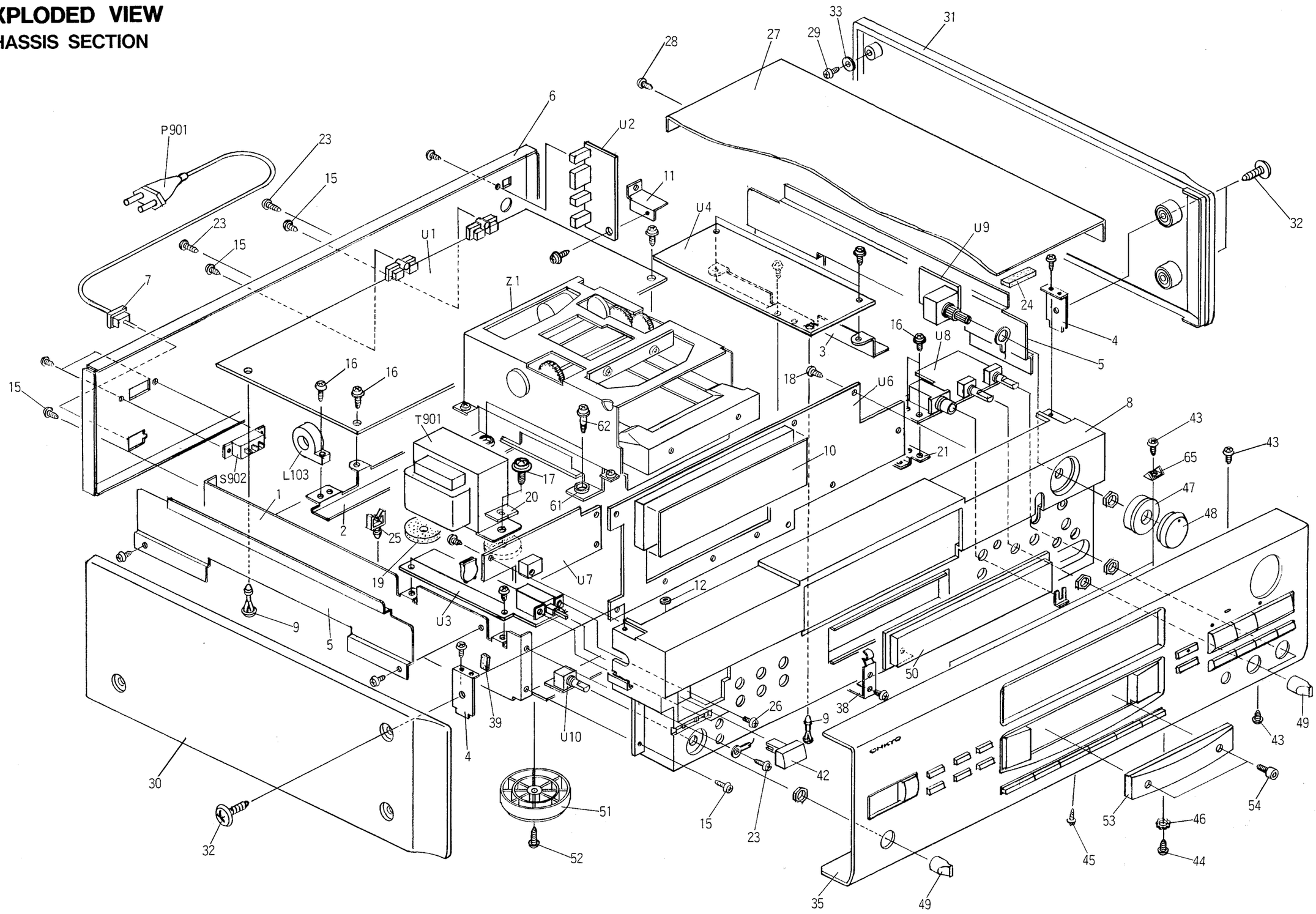
CHASSIS SECTION

REF.NO.	PART NO.	DESCRIPTION
1	27100250	Chassis
2	27141491	Bracket L
3	27141492	Bracket M
4	27141494	Bracket S
5	27130663	Bracket SI
6	27121513	Back panel <D>
	27121513-1	Back panel <P>
	27121513-2	Back panel <W>
7	27300750	⚠ Bushing,cord
8	27110661A	Front bracket
9	27190657	KGLS-18R,Holder
10	28133270	Back plate
11	27141500A	Bracket RI
12	27270142	Spacer
13	28199190	Film
14	27270346	Spacer
15	834430088	3TTS+8B(BC),Self-tapping screw
16	831130088	3TTW+8B,Self-tapping screw
17	834440128	4TTS+12B(BC),Self-tapping screw
18	833430080	3TTP+8P(BC),Self-tapping screw
19	27270213	Spacer
20	870065	Washer
21	27141495	Bracket HP
22	27190541	Holder,clamp
23	834230108	3TTS+10B(Ni),Nickel screw
24	28140837	Cushion
25	27300833	Clamp
26	82143006	3P+6FN(BC),Pan head screw
27	28184490A	Top cover
28	834430088	3TTS+8B(BC),Self-tapping screw
29	834440088	4TTS+8B(BC),Self-tapping screw
30	28185371	Side panel L
31	28185372	Side panel R
32	837440169	4TTT+16C(BC),Self-tapping screw
33	87644012	W4×12F(BC),Washer
35	1H177121UD	Front panel ass'y
	1H177121UPV	Front panel ass'y <V>
38	27180494A	Spring
39	28175190	Insulator plate
42	28324397	Knob,power
43	833430080	3TTP+8P(BC),Self-tapping screw
44	834430108	3TTS+10B(BC),Self-tapping screw
45	801230	3STS+8BQ(BC),Self-tapping screw
46	87313006	M-3B,Toothed washer
47	28324467	Knob,volume R
48	28324466	Knob, volume L
49	28324491	Knob,timer
50	28191605	Clear plate
51	27175254	Leg
52	838430088	3TTS+8B(BC),Self-tapping screw
53	28400726	Panel,tray
	28400726-1	Panel,tray <V>
54	84343008	3HSB+8FN(BC),Hexagone bolt
58	2041171510	Flat cable
59	870147	NK-011,Washer
60	223004-1	Terminal
61	24506972	Floating rubber
62	801454	Special screw
65	27141268	Bracket,ground
L903	230910	⚠ ESD-R-250B,Core
P901	253168	⚠ AS-UC-6#18,Power supply cord <D>
P901	253148	⚠ AS-CEE ZA,Power supply cord <P>
P902	2009990196	NSAS-12P0265,Socket ass'y
S902	25065123	⚠ NSS-1258P,Voltage selector switch <W>
T901	2300730A	⚠ NPT-1122D,Power transformer <D>
	2300731A	⚠ NPT-1122P,Power transformer <P>
	2300732A	⚠ NPT-1122DG,Power transformer <W>
U1	1H177579-1	NAAF-4279-1,Analogue,and power supply circuit pc board ass'y
U2	1H177580-1	NADG-4280-1,Digital IN/OUT terminal pc board ass'y
U3	1H177581-1	NAPS-4281-1,Power switch pc board ass'y
U4	1H177582-1	NADG-4282-1,Digital circuit pc board ass'y
U5	1H177583-1	NADG-4283-1,Gate circuit pc bord ass'y
U6	1H177584-1	NADIS-4284-1,Display circuit pc board ass'y
U7	1H177585-1	NADIS-4285-1,Remote control sensor pc board ass'y
U8	1H177586-1	NAAF-4286-1,Headphone amplifier pc board ass'y
U9	1H177587-1	NAAF-4287-1,Input level volume pc board ass'y
U10	1H177588-1	NASW-4288-1,Timer switch pc board ass'y
Z1	24717001A	NDT-3303,Mechanism ass'y

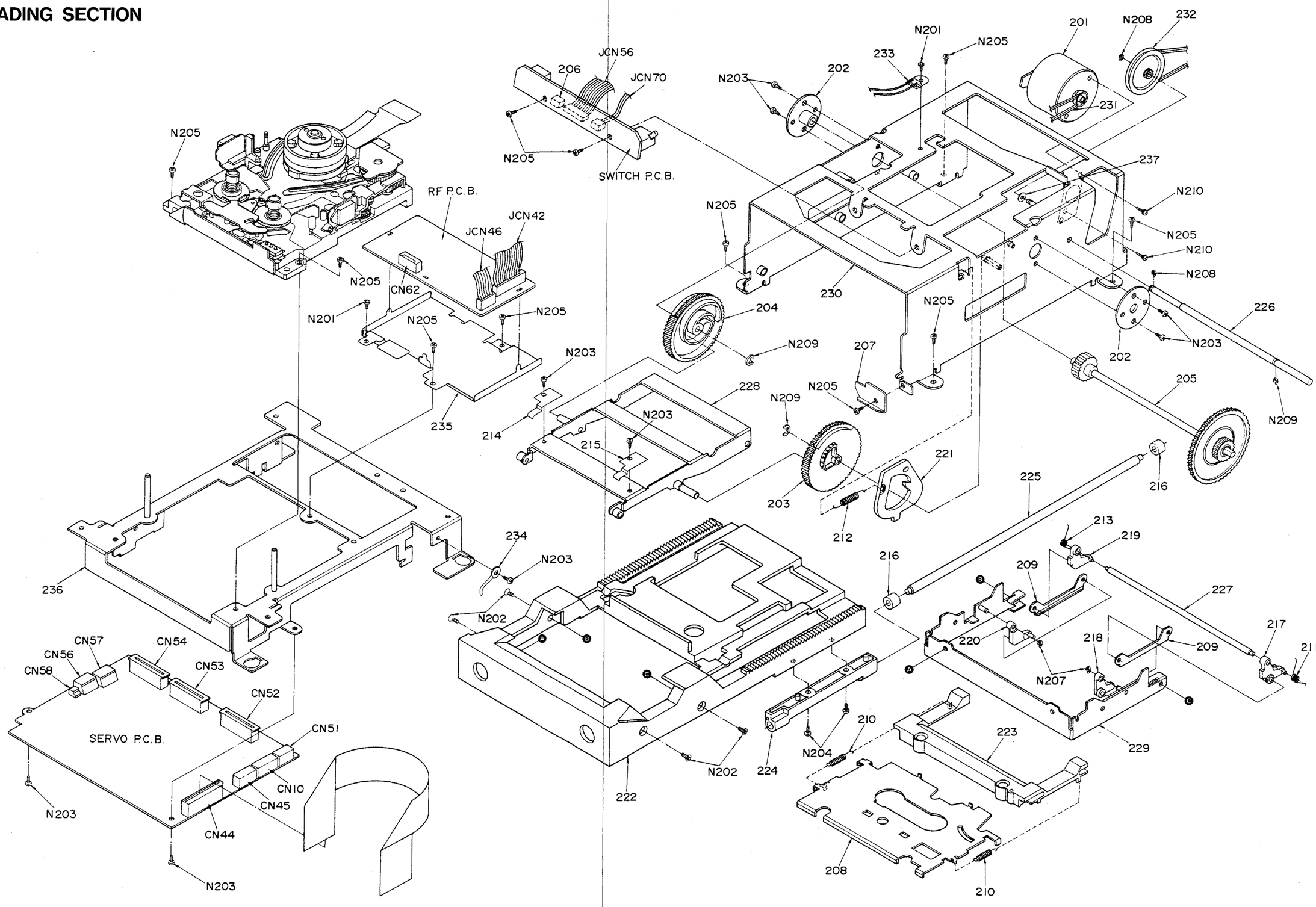
NOTE:<D>:Only 120V model
<P>:Only 230V model
<W>:Only Worldwide model
<V>:Only Germany model

NOTE:
THE COMPONENTS IDENTIFIED BY MARK ⚠ ARE CRITICAL FOR RISK OF FIRE AND ELECTRIC SHOCK. REPLACE ONLY WITH PART NUMBER SPECIFIED.

EXPLODED VIEW
CHASSIS SECTION



LOADING SECTION



LOADING SECTION

REF.NO.	PART NO.	DESCRIPTION
201	24702013	Tray motor ass'y
202	27301404	Holder,gear shaft
203	27301405	Main gear
204	27301406	Main gear
205	27301407	Gear shaft ass'y
206	2009990167	Connector(CN72)
207	27141460	Shaft frame
208	27141461	Bracket,cassette holder
209	27141462	Holder arm
210	27180468	Spring
211	27180469	Spring
212	27180470	Spring
213	27180471	Spring
214	27180472	Bracket
215	27180473	Bracket
216	28141085	Rubber
217	27301408	Holder,shaft
218	27301409	Holder
219	27301410	Holder,shaft
220	27301411	Holder
221	27301412	Holder,main gear
222	27301413	Tray
223	27301414	Cassette holder
224	27301415	Shaft bracket
225	27260303	Shaft
226	27260304	Shaft
227	27260305	Shaft
228	27141463	Sub frame
229	27141464	Cassette holder
230	27141465	Frame
231	27301417	Belt
232	27301416	Pulley gear
233	4000125	DEW sensor
234	27255008	Ground terminal
235	27141466	Shield plate
236	27141467	Mechanism frame
S751,S752	25065433	Open/Close switch
N201	82142003	2P+3F(BC),Pan head screw
N202	801462	Screw
N203	838430088	3TTB+8B(BC),Screw
N204	801463	Screw
N205	8213010	3P+10FN(BC),Screw
N206	838430068	3TTB+6B(BC),Screw
N207	8930151S	ES-1.5S,Washer
N208	8930201S	ES-2S,Washer
N209	8930301S	ES-3S,Washer
N210	801464	Screw

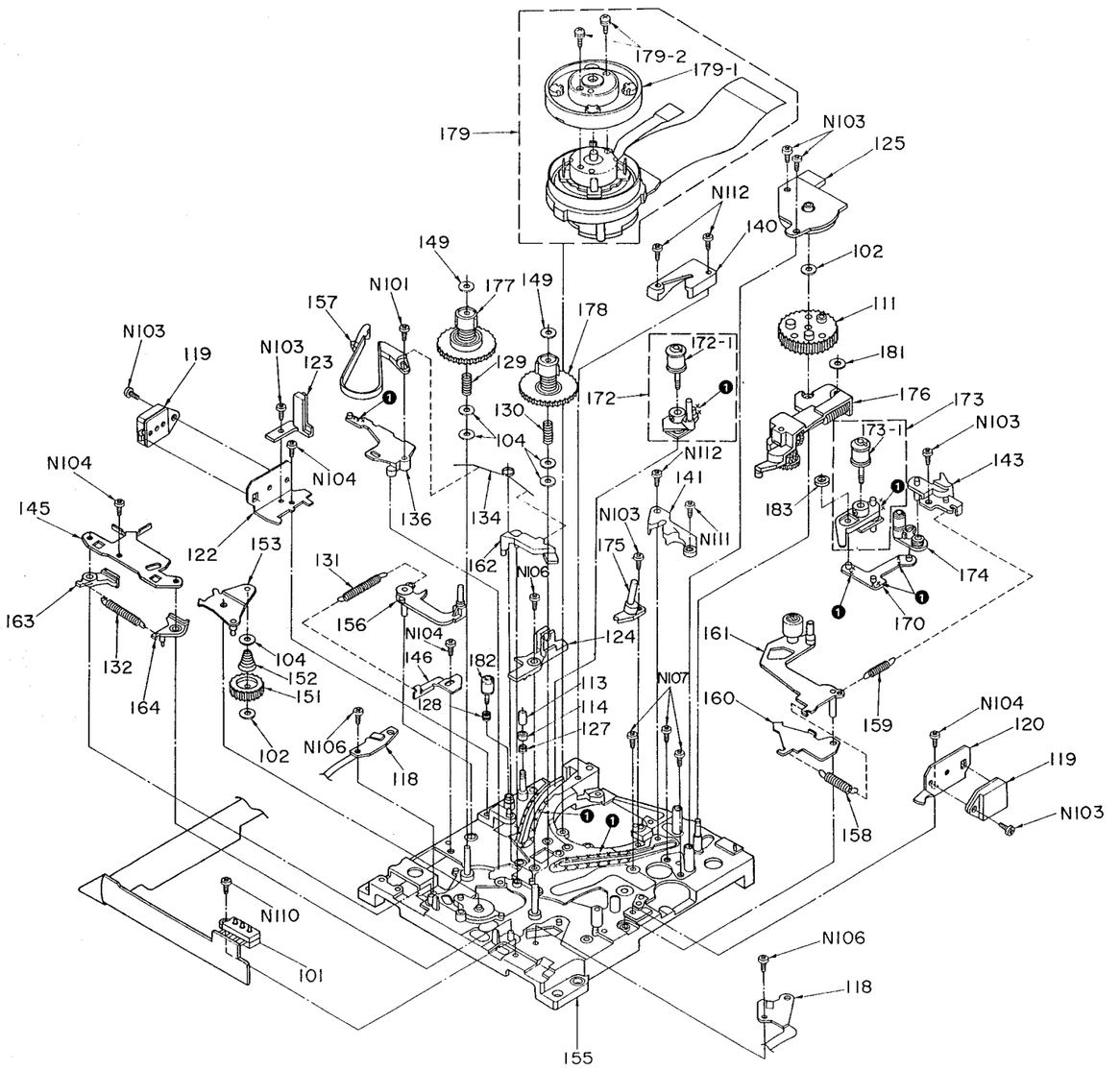
REF.NO.	PART NO.	DESCRIPTION
	24505291	RF pc board ass'y
	24505288	Servo pc board ass'y

MECHANISM SECTION

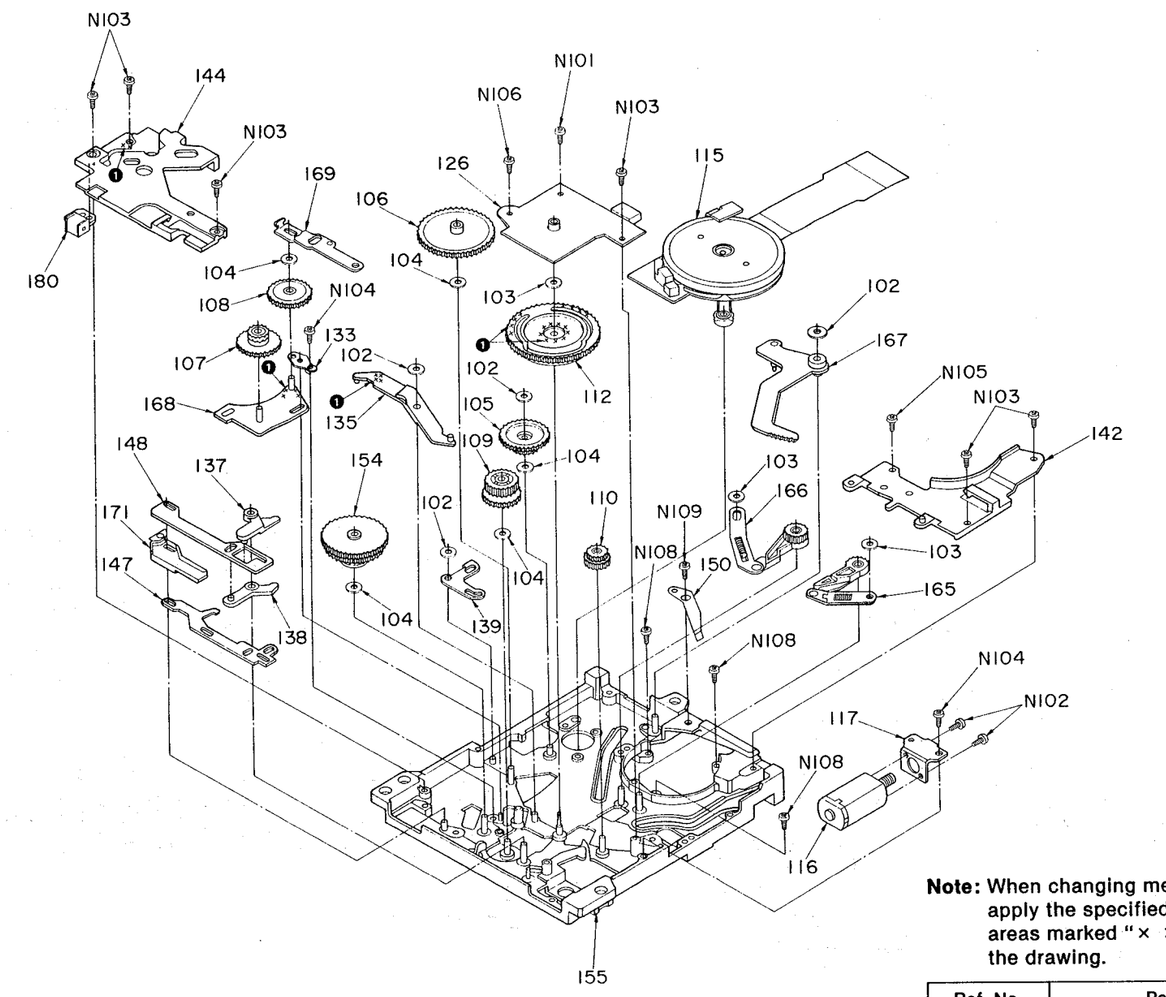
REF.NO.	PART NO.	DESCRIPTION
101	24714009	Cassette switch
[illegible]	24715013	Washer
103	24175014	Washer
[illegible]	24175015	Washer
105	24708008	Main gear A
106	24708009	Main gear B
107	24708010	Idler gear P
108	24708011	Idler gear F
109	24708012	Counter gear
110	24708013	Mode repeating gear
111	24708014	Load cam
112	24708015	Mode cam
113	24706010	Fixed post
114	24706011	Fixed post flange
115	24702011	Capstan unit
116	24702012	Mode motor ass'y(M701)
117	24715016	Holder,mode motor
118	24714010	Interface p.c.b.
119	24714011	Begin/End detector sensor ass'y
120	24715017	Begin detector bracket
122	24715018	End detector bracket
123	24715019	Lead opener
124	24714012	Begin/End detector LED ass'y
125	24714013	Load switch ass'y
126	24714014	Mode switch ass'y
127	24710027	Spring,fixed post
128	24710028	Spring,guide roller
[illegible]	24710029	Spring,supply reel
130	24710030	Spring,take-up reel
131	24710031	Spring,tension
132	24710032	Spring,brake
133	24715020	Bracket
134	24710033	Spring BT
135	24704006	Lever,pinch
136	24704007	Lever,tension
137	24704008	Lever,supply brake
138	24704009	Lever,takeup brake
139	24704010	Lever,load selector
140	24715021	Supply stopper
141	24715022	Takeup stopper
142	24715023	Load guide holder
143	24715024	Guide arm stopper
144	24715025	Mode guide plate
145	24715026	Idler guide
146	24715027	Tension spring hook
147	24715028	Supply brake drive plate
148	24715029	Tension brake drive plate
150	24715031	Ground bracket
[illegible]	24708016	Idler gear
[illegible]	24710034	Idler spring
[illegible]	24715032	Idler arm ass'y
[illegible]	24715033	Drive gear
155	24715034	Chassis unit
156	24715035	Tension arm ass'y
157	24715036	Tension band ass'y
158	24710035	Pin pressure spring
159	24710036	Pinch roller spring
160	24704011	Pin pressure spring
161	24715037	Pinch arm ass'y
162	24715038	BT lever ass'y
163	24715039	Supply brake ass'y
164	24715040	Takeup brake ass'y
165	24715041	Supply load arm
166	24715042	Takeup load arm
167	24715043	Load lever
168	24715044	P.F.idler ass'y
169	24715045	Lever,P.F. selection
170	24715046	Guide link ass'y
171	24715047	Plunger link ass'y
172	24715048	Supply post roller ass'y
173	24715049	Takeup post roller ass'y
174	24715050	Takeup guide roller
175	24715051	Takeup inclind base ass'y
176	24715052	Load holder ass'y
[illegible]	24715053	Supply reel ass'y
178	24715054	Takeup reel ass'y
179	24701006	Cylinder unit
180	24714015	Plunger
N101	24710037	Screw
N102	24710038	Screw
N103	24710039	Screw
N104	24710040	Screw
N105	24710041	Screw
N106	24710042	Screw
N107	24710043	Screw
N108	24710044	Screw
N109	24710045	Screw

MECHANISM SECTION

(Top view)



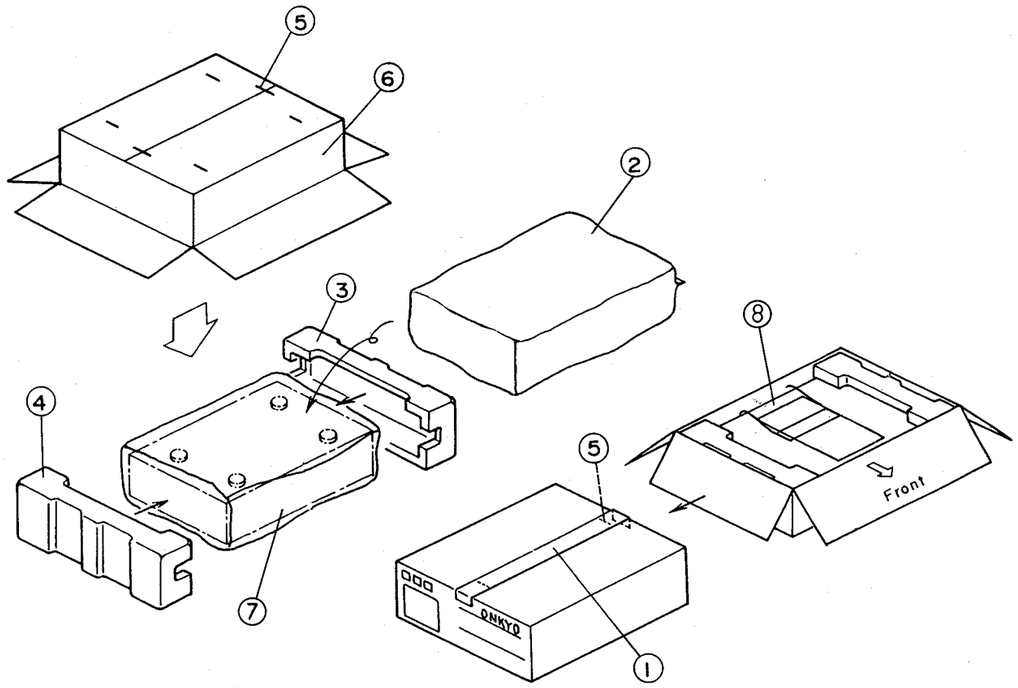
(Bottom view)



Note: When changing mechanism parts, apply the specified grease to the areas marked "× ×" as shown in the drawing.

Ref. No.	Part No.
❶	RZZ0L05

PACKING VIEW



REF.NO.	PART NO.	DESCRIPTION
1	29110071	Damplon tape
2	29095012-1	800×500mm,Protection sheet
3	29091518A	Pad L
4	29091519A	Pad R
5	282301	Scaling hook
6	29052304	Master carton box
7	29100105	620×550mm,Styrene bag
8	Accessary bag ass'y	
	2010166	Connection cord
	29341673	Instruction manual <D>
	29341674A	Instruction manual <P/W>
	24140213	RC-213D,Remote control transmitter
	2010200	Remote control cord
	3010054	UM-3,Two batteries
	29100097	350×250mm,Styrene bag
	29365019A	Warranty card <N>
	29365020D	Warranty card <V>
	29365024A	Warranty card <F>
	29358002J	Service station list <N>
	29100094A	Styrene bag for warranty card <V>
	29100107	Styrene bag for warranty card <F>
	25055040	CV-K-2,Conversion plug

NOTE:<D>:Only 120V Model
<P>:Only 230V Model
<W>:Only Worldwide Model
<N>:Only U.S.A. Model
<V>:Only Germany Model
<F>:Only French model

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